

Environment Effects Act 1978

Planning and Environment Act 1987

EES Inquiry and Planning Permit Application Panel Report

Golden Plains Wind Farm

26 September 2018

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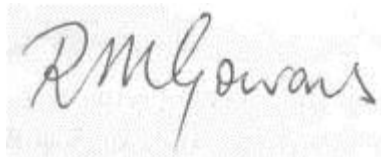
EES Inquiry and Planning Permit Application Panel Report

Golden Plains Wind Farm

26 September 2018



Sarah Carlisle, Chair



Rod Gowans, Member



Adrian Vlok, Member

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Glossary and abbreviations

BAM Plan	Bat and Avifauna Management Plan
BIOR reports	Biodiversity impacts and offset requirement reports
BL&A	Brett Lane & Associates
Brolga Guidelines	<i>Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population 2011</i> Revision 1 February 2012
CASA	Civil Aviation Safety Authority
<i>Cherry Tree</i>	<i>Cherry Tree Wind Farm Pty Ltd v Mitchell Shire Council & Ors</i> (Includes Summary) (Red Dot) [2013] VCAT 521
CHMP	Cultural Heritage Management Plan
CMA	Catchment Management Authority
Council	Golden Plains Shire Council
DELWP	Department of Environment, Land, Water and Planning
EE Act	<i>Environment Effects Act 1978</i>
EES	Environment Effects Statement
EES Guidelines	<i>Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978</i> , seventh edition, Department of Sustainability and Environment 2006
EMI	electromagnetic interference
EMMs	Environmental Management Measures
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
EVC	Ecological Vegetation Class
FFG Act	<i>Flora and Fauna Guarantee Act 1988</i>
kV	kilovolts
MNES	Matters of National Environmental Significance
MRSD Act	<i>Mineral Resources (Sustainable Development) Act 1990</i>
m/s	metres per second (wind speed)
MW	megawatts
NASF	National Airports Safeguarding Frameworks
New Zealand Standard	<i>New Zealand Standard 6808:2010 Acoustics – Wind farm noise</i>
NHMRC	National Health and Medical Research Council
OLS	Object Limitation Surface

PAN-OPS	Procedures for Air Navigation Services – Aircraft Operation
PE Act	<i>Planning and Environment Act 1987</i>
Permit Application	Golden Plains Planning Scheme Permit Application No. PA170266
Project	Golden Plains Wind Farm Project
PVA	Population Viability Analysis
SMO	Salinity Protection Overlay
SWER	Single Wire Earth Return
SWVLAS	South West Victoria Landscape Assessment Study
Victorian Wind Farm Guidelines	<i>Policy and planning guidelines for development of wind energy facilities in Victoria, November 2017</i>
VP	viewpoint
VPP	Victoria Planning Provisions

Overview

Project	
The Project	Golden Plains Wind Farm
Permit Application	Golden Plains Planning Scheme Planning Permit Application No. PA170266 for: <ul style="list-style-type: none"> - use and development of land for a wind energy facility and associated activities - use and development of land for a utility installation - removal of native and non-native vegetation - creation or alteration of access to a Road Zone Category 1 - demolition, removal or alteration of a dry stone wall - business signage.
The Proponent	WestWind Energy Pty Ltd
Project description	Construction of 228 turbines, foundations, overhead powerlines and underground cabling, four electrical collector stations, an electrical terminal station, battery energy storage, temporary quarry and other associated works.
Subject land	16,739 hectares of land located to the south, south east and west of Rokewood (approximately 60 kilometres north west of Geelong).
Victorian Statutory Approvals	Main approvals: <ul style="list-style-type: none"> - cultural heritage management plans under the <i>Aboriginal Heritage Act 2006</i> - a planning permit to be determined by the Minister for Planning under section 97F of the <i>Planning and Environment Act 1987</i> - a work authority and work plan under the <i>Mineral Resources (Sustainable Development) Act 1990</i> (for the temporary quarry)
Commonwealth Statutory Approval	Approval for a controlled action under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> due to potentially significant impacts on matters of national environmental significance.
Responsible Authority for the Permit Application	Minister for Planning
Exhibition	Between 4 May and 18 June 2018
Submissions	EES – 27 submissions (19 opposing, 5 supporting, 3 neutral) Permit Application – 29 submissions (12 opposing, 11 supporting, 6 neutral)

Inquiry and Panel process

The Inquiry and Panel	Sarah Carlisle (Chair), Rod Gowans and Adrian Vlok
Directions Hearing	Bannockburn Shire Hall, 6 July 2018
Panel Hearing	Bannockburn Shire Hall, 30 and 31 July, 1, 2, 7, 8, 9, 10 and 13 August 2018
Site inspections	Accompanied, 31 July 2018
Appearances	Refer Appendix C
Citation	Golden Plains Wind Farm (EES) [2018]
Date of this Report	26 September 2018

Response to Terms of Reference for the EES Inquiry

Terms of Reference item	Where responded in Report
24. The Inquiry must produce a written report for the Minister for Planning presenting the Inquiry's:	
a. Description of the proceedings conducted by the Inquiry and lists of those who made submissions, were heard and were consulted by the Inquiry	Chapter 1, Appendices B, C and D
b. Findings on the likelihood and significance of environmental effects (impacts) of the different components of the project documented in the EES, including specific findings about impacts on MNES protected under relevant controlling provisions of the EPBC Act	Chapters 4 to 13, 15
c. Advice regarding the availability and effectiveness of proposed feasible mitigation measures or controls to prevent, minimise or compensate for adverse effects (including on relevant MNES)	Chapters 4 to 13, 15
d. Recommendations on any necessary modifications to the project and/or specific design measures required to prevent, minimise or compensate for adverse effects (including on relevant MNES)	Chapters 4, 6 and 9
e. Recommendations on appropriate approval conditions that could be applied under Victorian law, necessary to achieve acceptable environmental outcomes in the context of applicable legislation and policy and of proponent commitments	Chapters 4, 7, 8, 9, 11, 13.5 and 13.8

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| f. Recommendations on the draft framework for environmental management for the project described in the EES, including in relation to the necessary controls, procedures and mechanisms; and | Chapter 14.2 |
| g. Conclusions (supported by information and analysis) on whether the Project will substantially meet evaluation objectives and deliver an appropriate balance of environmental, economic and social outcomes, having regard to public submissions, and the principles and objectives of ecologically sustainable development. | Chapters 4 to 13, 14.1 |
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Executive summary

(i) Summary

The Golden Plains Wind Farm Project (the Project) is proposed to be located on 16,739 hectares to the west, south and southwest of Rokewood. If built, the Project would be the largest wind farm in Victoria. It comprises 228 turbines with a projected total generation capacity of 800 to 1,000 megawatts (MW). The Project would add more than 3,500 gigawatt hours of clean energy into the national electricity market every year, providing enough electricity to power over 500,000 households, and saving more than 3.5 million tonnes of annual carbon dioxide equivalent emissions.

The Project will have environmental, social and economic impacts – some positive, some negative. Many of the impacts are likely to be more significant during the construction phase, and most negative impacts can be managed through the Environmental Management Measures proposed in the Golden Plains Wind Farm Environment Effects Statement (EES).

Some of the Project's impacts are more significant, and cannot be reduced through the proposed Environmental Management Measures. Visual and landscape impacts are an example. This, however, must be balanced against the fact that the landscape, while attractive and deeply valued by those who live in it, is not afforded special protection in the Golden Plains Planning Scheme.

The Project has the potential to impact on a number of flora and fauna species listed and protected under State and Commonwealth legislation, including Brolga. Brolga Guidelines issued by the then Department of Sustainability and Environment provide a policy framework and specific guidance for assessing and managing the impacts of wind farms on Brolga. The Brolga Guidelines adopt a precautionary approach of applying 3.2 kilometre turbine free buffers around known Brolga breeding sites, unless it can be shown with a high level of confidence that the size and shape of Brolga home ranges justify smaller buffers. The Proponent proposes reduced buffers for this Project – some as little as 700 metres. No other wind farm in Victoria has been approved with such small buffers.

In considering whether the Project should be approved, the adverse impacts of the Project must be balanced against the benefits that the Project offers. This includes balancing the impacts of the Project on Brolga against the consequences of requiring larger buffers to better protect Brolga. Competing objectives must be balanced in favour of an outcome that delivers net community benefit and sustainable development for the benefit of present and future generations. This is no easy exercise. The response to impacts should be reasonable and proportionate.

The Project will make a significant social and economic contribution to the local area and regional economy. It will make a significant contribution toward achieving government emissions reduction targets and renewable energy targets, and will fulfil a vital role in reducing greenhouse gas emissions, and transitioning the Victorian economy toward net zero emissions.

The Panel was not persuaded that the Proponent has demonstrated with a high degree of confidence that the Brolga home ranges on the Project site justify a reduction in the buffers

to 700 metres. Accordingly, the Panel requested the Proponent to provide information on the impacts of alternative buffers, including the default 3.2 kilometre buffers recommended under the Brolga Guidelines, and the approach developed by Brett Lane and Associates (which has been accepted by previous panels) of modifying the default buffers by applying a polygon around all wetlands within 3.2 kilometres of a known breeding site (BL&A habitat model buffers).

While the default 3.2 kilometre buffers would deliver a substantial reduction in the impacts on Brolga, the consequences for the Project would be profound. Up to 117 turbines would be lost, threatening the viability of the Project. The BL&A habitat model buffers will result in the loss of up to 47 turbines, or 245MW of renewable energy generation capacity.

What is less clear is the impact on Brolga. In the absence of empirical site-specific data that enables the Panel to fully understand the impacts of the Project (including the proposed and alternative buffers) on Brolga, the Proponent is effectively asking the Panel to rely on predictions of collision risk modelling in assessing those impacts. The collision risk modelling involves significant uncertainty.

In light of that uncertainty, the Panel recommends the Project be modified to provide BL&A habitat model buffers turbines around the known Brolga breeding wetlands on, and within 3.2 kilometres of, the Project site. The Panel considers that this strikes a reasonable balance between facilitating the Project and the many benefits that it will deliver, against the need to protect the Victorian Brolga population.

If the Panel were to support the Proponent's reduced buffers in the absence of a high level of confidence that reduced buffers were appropriate, the value of the Guidelines would be significantly undermined. Not only would this potentially result in a bad outcome for Brolga in this particular case, it would set a dangerous precedent for future wind farm proposals. The Panel does not consider that such an approach would deliver a net community benefit, or a sustainable development outcome that it is in the interests of present and future Victorians.

The remaining impacts of the Project can be suitably managed through the proposed Environmental Measures, most of which can be implemented through conditions on the planning permit for the Project. The Panel has recommended various changes to proposed permit conditions, and some additional permit conditions, to further reduce the Project's impacts. If the Panel's recommendation to apply BL&A habitat model buffers is adopted, many of the other impacts of the Project (in particular visual and landscape impacts and noise impacts) will be further reduced.

(ii) Conclusions and recommendations

Overall, the Panel is satisfied that a modified Project, when constructed, will result in a net community benefit, and will make a significant contribution to sustainable development, subject to the recommendations in this Report, including applying turbine free buffers based on the BL&A habitat model. The environmental effects of a modified Golden Plains Wind Farm project can be managed to an acceptable level and the relevant project approvals should be granted, subject to the recommendations in this Report.

Based on the reasons set out in this Report, the Panel recommends:

- 1. Modify the Project generally in accordance with the plan shown in Document 86, to apply the Brett Lane & Associates habitat model turbine free buffer to each of the 27 Brolga breeding sites identified in and within 3.2 kilometres of the wind farm site.**
- 2. Require the Proponent to clearly map the full extent of the turbine free buffers, with the final home range polygon boundaries determined in conjunction with Department of Environment, Land, Water and Planning - Environment.**
- 3. Define the boundary for wetland 25 from the edge of the Plains Grassy Wetland Ecological Vegetation Class as mapped in the vegetation assessment, not the edge of the wetland. The final boundary of the terminal station site should be determined in conjunction with Department of Environment Land Water and Planning - Environment.**
- 4. Issue planning permit PA170266 for the Golden Plains wind energy facility subject to the permit conditions contained in Appendix F.**

Specific recommendations for statutory decision makers who may issue other approvals for the Project (apart from the primary approval of the planning permit) are addressed in Chapters 14.2 and 15.

(iii) Further recommendations

The Panel makes the following further recommendations:

- 5. Department of Environment, Land, Water and Planning - Environment should:**
 - a) continue to compile the monitoring results of Brolga impacts at all Victorian wind farms, to provide data to:**
 - enable validation of Brolga collision risk modelling
 - clarify the limits and approximations in Brolga collision risk modelling
 - clarify the uncertainties in the predictions
 - b) conduct a regular state census or coordinated count of Brolga, to enable a better understanding of overall trends in the Victorian Brolga population and the cumulative impacts on the overall population from wind farms**
 - c) coordinate a regional response to Brolga habitat planning, restoration and management to ensure the survival of the species in Victoria, including the coordinated mapping of Brolga turbine free buffer areas**
 - d) make the information referred to in Recommendations 5(a) to (c) publicly available**
 - e) continue to undertake evaluation of the cumulative effects of wind farms on raptor populations and other native species that may be vulnerable to wind farm mortality, and determine the need for appropriate mitigation measures**
 - f) publish a standard for the assessment of the Western (Basalt) Plains Grassland Ecological Vegetation Class for native vegetation clearance applications.**

PART A: BACKGROUND

1 Background

1.1 The proposal and project area

(i) General description of the Project

The Golden Plains Wind Farm Project (the Project) is proposed to be located on 16,739 hectares to the west, south and southwest of Rokewood. Rokewood is approximately 60 kilometres north west of Geelong. The site is mostly used for agricultural purposes.

The Moorabool to Mortlake/Tarrone 500 kilovolt (kV) transmission line traverses the southern portion of the site. The Project proposes to connect directly into the high voltage transmission line, to enable a direct connection into the national electricity grid. The Proponent submitted that connecting directly into the grid, as opposed to the mid-voltage powerlines that are usually used to connect a wind farm to the grid, will avoid the need for project-related overhead power lines external to the site.



Figure 1 The subject land

As proposed, the Project would be the largest wind farm in Victoria. It comprises 228 turbines with a projected total generation capacity of 800 to 1,000 megawatts (MW). The Project would add more than 3500 gigawatt hours of clean energy into the national electricity market every year, providing enough electricity to power over 500,000 households, and saving more than 3.5 million tonnes of annual carbon dioxide equivalent emissions.

The Project incorporates the following infrastructure components. The infrastructure footprint covers 251 hectares (1.5 per cent of the site area):

- 228 turbines, each with:
 - a capacity of 3 to 5 MW

- a height of approximately 230 metres from natural ground level to blade tip at highest point
- a rotor diameter in the order of 150 metres
- a rotor sweep of at least 40 metres above natural ground level
- turbine foundations consisting of concrete gravity or rock anchor foundations with a depth of approximately 3.5 metres and a diameter of 20 to 25 metres
- hardstand and laydown areas associated with each turbine
- up to six permanent meteorological masts (anemometers)
- intersection and site access upgrades
- 146 kilometres of internal access tracks 5 metres wide (7.5 metres wide on corners)
- four internal collector stations and one internal terminal station
- an underground internal collector network consisting of electricity cables buried to a depth of approximately one metre, connecting the turbines to the collector stations
- overhead powerlines connecting the four collector stations to the terminal station
- overhead powerlines connecting the terminal station to the existing high voltage transmission line traversing the site
- site offices, amenities and provision for a battery energy storage system
- temporary construction infrastructure including:
 - an on-site quarry to provide a local source of construction rock
 - four construction compounds
 - five concrete batching plants (one on the quarry site and four co-located with construction compounds).

The Proponent expects that construction will take place in four stages, commencing in March 2019 with completion in four to six years.

(ii) Onsite quarry

Most of the hard rock required for construction of the Project is proposed to be supplied by a temporary onsite quarry in Meadows Road. The quarry will operate during the construction period and is expected to provide 1 to 2 million tons of material. The Proponent submitted that the onsite quarry will contribute to a reduction of truck movements on external roads, and a reduction in construction costs. At the end of the construction phase the quarry will be rehabilitated and returned to agricultural use.

(iii) Project objectives

The Environmental Effects Statement (EES) main report states at page 1-5 that the Project will be *“a major generation source of reliable, affordable and clean electricity for Victoria and the [national electricity market] and to support Victoria’s transition towards a cleaner electricity sector”*. According to the EES main report, the Project will:

- drive economic development in the region
- support the local community
- increase renewable energy supply within the national electricity market, contributing to reliability and reducing the wholesale cost of electricity
- support the Victorian Renewable Energy Target

- support initiatives under the *Climate Change Act 2017* to help achieve a long-term emissions reduction target of net zero emissions by 2050
- assist the Commonwealth Government's emission reduction commitments under the Paris Agreement.

(iv) Project design

Chapter 6 of the EES main report describes the design process for the Project. Document 88 provides more detail in relation to the design process. The design seeks to balance maximising the site's wind resource and efficient generation of electricity at the lowest possible cost, and the need to avoid or minimise environmental and social impacts.

The Proponent's opening submission explained that the turbines are arranged generally in rows aligned with predominant winds, to ensure maximum power generation. Turbines within rows are generally located at least 650 metres apart, and rows are generally located at least 900 metres apart, to ensure each turbine has maximum wind exposure.

The initial design has been refined to take account of site constraints. This has included relocating and repositioning turbines and other infrastructure to respond to:

- Aboriginal places of significance
- places of high environmental significance
- places that contain protected or listed species, ecological communities or habitats (including Brolga)
- agricultural practices on the host properties.

1.2 The requirement for an EES

The Project was referred to the Minister for Planning under the *Environment Effects Act 1978* (the EE Act) for a decision as to whether an EES was required. On 9 July 2017, the Minister advised the Proponent under section 8B of the EE Act that an EES was required, due to potential impacts on:

- critically endangered native vegetation communities and species
- local and regional landscape value and visual amenity of the area
- the environmental and social setting, including surface water, groundwater, noise and traffic impacts.

Under section 8C of the EE Act, approval decisions under Victorian legislation cannot be made until the Minister has prepared an assessment of the EES and the environmental effects of the Project, and the Minister's assessment has been considered by the relevant decision maker.

1.3 Project approvals

(i) Commonwealth approval

The Project was referred to the Commonwealth Department of the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). On 24 July 2017, the Commonwealth determined that the Project was a controlled action, due to potential significant effects on Matters of National Environmental Significance (MNES) – specifically, threatened species and communities listed under the EPBC Act. Pursuant to the

Bilateral Agreement between the Commonwealth and Victoria, the EES process is accredited to provide the necessary assessment under the EPBC Act. The approval decision under the EPBC Act will be informed by the EES, but will be made by the Commonwealth Minister for the Environment.

(ii) State approvals

Planning approval

The Project requires planning approval under the *Planning and Environment Act 1987* (the PE Act). The Minister for Planning is the Responsible Authority for the purposes of assessing and determining the permit application. The Golden Plains Shire Council (Council) is the Responsible Authority for the purposes of administering and enforcing the permit.

Aboriginal heritage

A Cultural Heritage Management Plan (CHMP) will be required for the Project under the *Aboriginal Heritage Act 2006*, to manage works in areas of cultural heritage sensitivity. A CHMP must be approved before any Victorian statutory approvals, including the planning permit, can be issued. Separate CHMPs are being prepared for the wind farm, and for the temporary quarry.

Quarry approval

The proposed on-site quarry requires an approved Work Plan and Work Authority for extractive industry under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act). If approved under the MRSD Act, the quarry will not require a planning permit, or a works approval or licence under the *Environment Protection Act 1970*. Document 18 provides more detail in relation to exemptions from the need for a works approval or licence.

Other approvals

The Project may require a number of secondary approvals and consents, as outlined in Chapter 3 of the EES main report. They include:

- a permit to remove protected species or habitat under the *Flora and Fauna Guarantee Act 1988* (FFG Act)
- a permit to remove soil containing noxious weeds under the *Catchment and Land Protection Act 1994*
- a licence to take and use water from a waterway, groundwater, spring or soak under the *Water Act 1989*.

1.4 Exhibition and Panel process

Submissions on the EES were made directly to Planning Panels Victoria, through the Engage Victoria website. Submissions on the Permit Application were made to DELWP Planning on behalf of the Minister for Planning (Responsible Authority for the Permit Application). Planning Panels Victoria provided copies of the EES submissions to DELWP Planning, and DELWP Planning provided copies of the Permit Application submissions to Planning Panels Victoria. Consequently, two full sets of submissions were received by the Panel – one set to the EES and one set to the Permit Application.

All submitters were given the opportunity to present at the Panel Hearings by completing a request to be heard form.

At the close of exhibition, 26 submissions were received in relation to the EES and 26 submissions were received in relation to the planning permit application. One late EES submission (submission 27) was received by Planning Panels Victoria, and three late Permit Application submissions (submissions PP27, PP28 and PP29) were received by DELWP Planning.

Five of the EES submissions were in support of the Project, 19 objected and 3 were neutral. Eleven of the Permit Application submissions were in support, 12 objected and 6 were neutral. Submissions raised a number of issues including noise impacts, impact on fauna and flora including broilga, health impacts, landscape and visual impacts, property devaluation, road safety, impacts on water, aviation and shadow flicker, heritage, turbine free buffers to protect Broilga and other wildlife, electromagnetic interference, the quarry and economic benefits and impacts.

On 17 June 2018, Sarah Carlisle (Chair), Rod Gowans and Adrian Vlok were appointed by the Minister for Planning as:

- the Inquiry under the EE Act to inquire into the potential environment effects of the Project
- a Panel under Part 8 of the PE Act to consider submissions to the Permit Application.

The Inquiry and Panel are collectively referred to as the Panel in this Report.

Minister for Planning signed the Inquiry's Terms of Reference on 27 May 2018. A copy is provided in Appendix A:

- Clause 3 states that the Inquiry's purpose is *"To inquire into and provide an integrated assessment of the potential effects of the proposed Golden Plains Wind Farm Project (the project)"*.
- Clause 4 states that the Inquiry's task is to *"produce a report to inform the Minister for Planning's assessment of the environmental effects of the project under the Environment Effects Act 1978 (EE Act) and in turn assist statutory decision making required for the project, including under the PE Act"*.
- Clause 5 states that *"the Inquiry is to consider submissions received and the exhibited Environment Effects Statement (EES) documentation and report on the potential environmental effects of the Golden Plains Wind Farm, proposed on-site quarry and electricity transmission and other associated infrastructure investigated in the EES"*.

The Panel held a Directions Hearing on 6 July 2018. The main Hearing was held over nine days between 30 July and 10 August 2018. The Hearings were held in Bannockburn. Nineteen submitters presented to the Panel at the Hearing. A list of appearances is contained in Appendix D.

The Panel undertook a site visit on 31 July 2018, accompanied by the Proponent and several of the submitters. The site visit included the proposed sites for the quarry and the terminal station, the Rokewood township (including the school and child care centre), various viewpoints from which photomontages had been prepared for the Landscape and Visual Assessment, several of the submitters' properties and some Broilga breeding sites. The

Proponent prepared a site visit agenda and booklet which proved to be a useful reference during both the site visit and the Hearing.

1.5 Procedural issues

On 10 July 2018, the Panel issued directions for the conduct of the Hearing and the site visit, and for the provision of further information by DELWP Planning, the Proponent and Council. The Panel issued further oral and written directions during the course of the Hearing, to address various procedural issues that arose.

On 29 July 2018, the day before the commencement of the Hearing, Planning Panels Victoria received an email from Mr Cumming (Document 9). Mr Cumming sought a written response from the Panel to the following issues (in summary):

- whether the Panel is independent, or whether its role is to facilitate the Project
- whether the Panel process is a “box ticking exercise so DELWP can claim the community was consulted, but the consultation has no weight on the Panel”
- the relative weight the Panel will give to evidence submitted by the Proponent, and to reports and documents provided by submitters (and in particular whether the Panel will treat reports and documents provided by submitters as evidence)
- whether the Panel will accept “directions” given by DELWP
- whether the Panel will allow submitters an opportunity to respond to material in the Proponent’s closing submissions and right of reply that they regard as inaccurate, misleading or not truthful.

This email was circulated to all parties to the Hearing, and to the Secretary of DELWP and various DELWP staff in the Planning Portfolio, Environment Portfolio and Impact Assessment Unit. Later that day, Mr Dean replied to all recipients of the email, raising similar issues (Document 29). The Panel prepared a written response to the emails as requested (Document 35).

On the first day of the Hearing, the Panel issued oral directions to DELWP Environment requesting DELWP Environment to address the Panel on various matters arising from its submission to the EES. The matters were subsequently confirmed in writing by the Panel (Document 30). DELWP Environment tabled a written response to the Panel’s questions (Document 72) when it made its presentation at the Hearing.

The Panel sought further clarification in relation to a number of matters arising DELWP Environment’s submission to the Hearing (Document 71) and its response to the Panel’s initial questions (Document 72). It also requested that DELWP Environment respond to Mr Lane’s expert witness statement regarding biodiversity matters (Document 46). DELWP Environment requested and was granted additional time to provide a written response to the Panel’s further questions. DELWP Environment’s responses were received on 16 August 2018 (Documents 101 and 102).

During the course of the Hearing, it became apparent that a large volume of emails and material were circulating among the parties outside the Hearing. The Panel issued further directions by email dated 6 August 2018 which stated as follows:

Over the past several days the Panel has received a large volume of material from parties that was not requested by the Panel. The Panel will not accept any

information in this process that is not formally tabled by a party at the Hearing. This applies to all information circulated by email since the close of submissions. If there is information you wish to bring to the Panel's attention, you will need to formally table the information at the Hearing when you are presenting your submission.

The Panel has received email correspondence from various parties seeking directions from the Panel. The Panel will not consider any requests for directions other than those made formally at the Hearing. Any requests for directions must be raised as a preliminary matter at the start of each day.

It has come to the Panel's attention that parties are corresponding directly with one another outside of the Hearing, and without always copying in Planning Panels Victoria. The Panel regards this behaviour as inappropriate. The Hearing is the process for ventilating the issues in an open and transparent manner. Outside correspondence should cease forthwith. The Panel will not have regard to any correspondence received outside the Hearing.

Notwithstanding the Panel's further directions, Mr Cumming continued to correspond with Planning Panels Victoria directly and by copying it in on emails sent to others after the conclusion of the Hearing. The Panel has not had regard to this correspondence.

Dr Reed indicated that he intended to call expert evidence at the Hearing when he completed a Request to be Heard Form. He did not, at the time, indicate who he intended to call, or in what field.

The Panel's directions dated 10 July 2018 required all parties to:

- inform the Panel and all other parties who they intended to call by 11 July 2018
- circulate expert witness statements by 20 July 2018.

On 30 July 2018, Planning Panels Victoria received an email directly from Mr Moran attaching his CV and a witness statement. Mr Moran was not a submitter, and was not a party. The Panel took submissions from the parties on 2 August 2018 in relation to whether or not it should accept Mr Moran's witness statement. The Proponent objected to the Panel accepting Mr Moran's statement, essentially on three grounds:

- it was circulated late without explanation
- there was no indication that the statement was prepared in accordance with the Planning Panels Victoria Guide to Expert Evidence (as required by the Panel's directions)
- it is not relevant to the matters before the Panel.

After providing Dr Reed with an opportunity to respond to the Proponent's submissions, the Panel made a ruling that it would not accept Mr Moran's statement as evidence. The Panel provided reasons for its ruling orally at the hearing on 7 August 2018.

Dr Reed made his submission to the Panel on 9 August 2018. He was accompanied by Mr Moran. Mr Moran spoke to his statement. The Panel accepted the material by way of submission, not as expert evidence.

1.6 Issues dealt with in this Report

The Panel considered all written submissions made in response to the exhibition of the EES and the Permit Application, observations from the site visit, and submissions, evidence and other material presented to it during the Hearing. The Panel has reviewed a large volume of material. The Panel has had to be selective in referring to the more relevant or determinative material in the Report. All submissions, evidence and materials have been considered by the Panel in reaching its conclusions, regardless of whether they are specifically mentioned in the Report.

This Report is in three parts.

Part A (Background) includes:

- a description of the Project, the site and the surrounding area
- a discussion of the requirement for an EES
- a discussion of the statutory approvals required for the Project
- an outline of the Panel's approach to the assessment of environmental effects
- an outline of the assessment framework.

Part B (Assessment of environmental effects and submissions) includes a discussion of the Project's impacts, issue by issue. It includes:

- the Panel's assessment of each issue, including:
 - whether the relevant EES evaluation objectives can be achieved
 - whether the proposed Environmental Management Measures are effective to prevent, minimise or compensate for adverse effects
- an integrated assessment of the Project as a whole, including whether the Project will deliver a net community benefit and sustainable development
- the Panel's assessment of whether a planning permit should issue for the Project (the Panel's recommended permit conditions are in Appendix F)
- recommendations to statutory decision makers who are responsible for issuing statutory approvals for the Project (refer to Table 10 in Chapter 14.2 regarding State approvals, and Chapter 15 regarding the Commonwealth approval).

Part C (Commonwealth matters) includes a discussion of the Project's impacts on MNES.

2 Approach to the assessment of environment effects

2.1 Introduction

The Panel's assessment of the environmental effects of the Project will inform the Planning Minister's assessment of the Project under the EE Act. The Minister's assessment will be provided to the relevant decision makers who hold the powers under legislation to issue the statutory approvals for the Project. The Minister is himself a decision maker in respect of the planning permit for the Project.

2.2 Scoping requirements and evaluation objectives

The *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978*, seventh edition, 2006 (the EES Guidelines) are issued under section 10 of the EE Act. They provide detail about the administration of the EES process. Among other things, they set out the process for:

- scoping and preparing an EES
- public review of an EES
- considering public submissions.

The DELWP Impact Assessment Unit prepares scoping requirements for an EES on behalf of the Minister for Planning. The scoping requirements set out the matters to be investigated and documented in an EES. The EES Guidelines state that scoping requirements (and EES documentation) should adopt:

- a systems approach (including consideration of potential interdependencies between physical systems, ecological systems, human communities, land use and economic effects)
- a risk based approach (to ensure that assessment is proportionate to the risk of adverse effects).

The scoping requirements for the Project were issued in December 2017. They include evaluation objectives which identify desired outcomes in relation to potential environmental effects, and provide a framework to guide an integrated assessment of those effects.

2.3 Environmental Management Framework

The scoping requirements require the EES to detail the proposed Environmental Management Framework for the Project. The Environmental Management Framework is contained in Chapter 23 of the EES main report. The Environmental Management Framework is critical, as it provides the overall approach to managing environmental impacts through the construction, operation and decommissioning of the Project.

The Environmental Management Framework contains Environmental Management Measures (EMMs) which are designed to manage the potential environmental effects of the Project. The EMMs, which are listed in Table 23.3 of the EES main report, set out measures to address a range of impacts. The EMMs are intended to be implemented through the statutory approvals

for the Project, primarily the planning permit. Document 92 provides a detailed explanation of how the EMMs are intended to be implemented.

The EMMs have informed the Panel's recommended planning permit conditions in Appendix F. Table 10 in Chapter 14.2 provides advice and recommendations in relation to the implementation of the (relatively few) EMMs that will not be implemented through conditions on the planning permit.

2.4 The Panel's approach

The Panel has used the evaluation objectives to frame its consideration of the environmental effects of the Project. The Panel's conclusions in relation to each evaluation objective are set out at the end of each chapter dealing with individual issues. The Panel then sets out its integrated assessment of the Project in Chapter 14. The Panel comments on the Environmental Management Framework and EMMs where necessary through the issue-specific chapters. Where EMMs are not specifically addressed, this is an indication that the Panel supports the EMM.

3 The assessment framework

3.1 Legislative framework

Except where indicated otherwise, the legislation referred to in this Report is Victorian legislation.

(i) The Climate Change Act

The *Climate Change Act 2017* provides a foundation to manage climate change risks and support Victoria's transition to a net zero emissions climate resilient economy. It states:

The Parliament of Victoria recognises that some changes in the earth's climate are inevitable, despite all mitigation efforts. Victoria is particularly vulnerable to the adverse effects of climate change. Natural disasters are increasing in frequency and severity as a result of the changing climate. Impacts are felt differently and to different extents across individual regions and communities.

Although responding to climate change is a responsibility shared by all levels of government, industry, communities and the people of Victoria, the role of subnational governments in driving this transition cannot be understated. Through decisive, long-term action to reduce greenhouse gas emissions, the Victorian government can help Victoria achieve an orderly and just transition to a net zero greenhouse gas emissions economy and remain prosperous and liveable. It will also enable Victoria to benefit from the global trend towards decarbonisation.

Section 20 of the Act requires the Victorian Government to ensure that its decisions appropriately take climate change into account:

20 Decision and policy making

The Government of Victoria will endeavour to ensure that any decision made by the Government and any policy, program or process developed or implemented by the Government appropriately takes account of climate change if it is relevant by having regard to the policy objectives and the guiding principles.

The policy objectives are set out in section 22, along with six guiding principles.

Victoria's Climate Change Framework

Victoria's Climate Change Framework was prepared under the Climate Change Act. It identifies four pillars that underpin the transition to a climate resilient and net zero emissions Victoria by 2050. The pillar of particular relevance to the Project is:

- *Move to a clean electricity supply by increasing renewable energy generation.*

(ii) Environment Effects Act

The *Environment Effects Act 1978* (EE Act) provides for the assessment of the potential environmental impacts or effects of a project, via an Environment Effects Statement (EES) process. The assessment process does not result in an approval. Rather, it is used to inform

other statutory decision-makers to make decisions about whether the project should proceed (and on what terms).

The EE Act and the EES Guidelines (which are discussed in more detail in Chapter 1.2) set out the process for the Minister for Planning to determine whether or not an EES is required, the scoping of an EES, the preparation and public exhibition of an EES, and the appointment of an Inquiry to consider the EES and submissions.

If a project requires assessment under both the EE Act and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), the EES process is accredited under the Assessment Bilateral Agreement between the Commonwealth and Victoria. This means that proponents do not have to undertake two separate assessment processes.

Under the *Aboriginal Heritage Act 2006*, a Cultural Heritage Management Plan (CHMP) must be prepared for every project that requires an EES.

(iii) Planning and Environment Act

The *Planning and Environment Act 1987* (the PE Act) provides a framework for planning and regulating the use, development and protection of land in Victoria. It sets out the procedures for assessing and determining planning permit applications.

Section 4 of the PE Act contains the objectives of planning in Victoria, that guide all planning decisions (including decisions on whether to issue a planning permit). They include:

- *to provide for the fair, orderly, economic and sustainable use, and development of land*
- *to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity*
- *to secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria*
- *to conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value*
- *to balance the present and future interests of all Victorians*
- *to ensure that the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use and development of land.*

Section 60 sets out the matters that a Responsible Authority must consider when deciding whether to grant a planning permit. As well as the planning objectives set out above and the relevant planning scheme, the Responsible Authority must consider:

- objections
- decisions and comments of referral authorities
- any significant effects the use or development may have on the environment (or which the environment may have on the use or development).

The Responsible Authority may consider:

- significant social and economic effects
- State Environment Protection Policies (SEPPs)

- any other strategic plan, policy statement, code or guideline which has been adopted by a Minister, government department, public authority or municipal council.

(iv) Mineral Resources (Sustainable Development) Act

The *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act) provides a framework for developing and regulating the mineral exploration and mining industry, and extractive industries (quarries). It operates in conjunction with the PE Act. A quarry that has an approved work authority and work plan under the MRSD Act does not require a planning permit under the PE Act.

The objectives of the MRSD Act include:

- ensuring risks posed to the environment, the public, or to land, property or infrastructure by quarrying are identified and eliminated or minimised as far as reasonably practicable
- ensuring land which has been quarried is rehabilitated
- recognising that stone extraction must be carried out in a way that is not inconsistent with the *Native Title Act 1993* (Cth) and the *Land Titles Validation Act 1994*.

Section 2A provides that it is Parliament's intention that the MRSD Act be administered having regard to the principles of sustainable development, including community wellbeing, protection of biological diversity and ecological integrity, the need for a strong economy, the need for development to make a positive contribution to regional development, and the need to respect the aspirations of Aboriginal people.

(v) Environment Protection and Biodiversity Conservation Act

The EPBC Act is the main environmental legislation of the Commonwealth Government. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the Act as Matters of National Environmental Significance (MNES).

The objectives of the EPBC Act include:

- protecting the environment, especially MNES, and conserving Australian biodiversity
- providing a streamlined national environmental assessment and approvals process
- promoting ecologically sustainable development through the conservation and ecologically sustainable use of natural resources
- recognising the role of Indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity.

(vi) Flora and Fauna Guarantee Act

This Act relates to biodiversity, conservation and sustainable use of native flora and fauna in Victoria and applies to public land. Threatened species and threatened ecological communities exist along parts of some of the road reserves of roads to be used to access the Project site, and government roads within the Project site. Where removal of FFG species is required on public land, a permit to take listed species is required.

(vii) Catchment and Land Protection Act

The *Catchment and Land Protection Act 1994* requires that land owners (or a third party to whom responsibilities have been legally transferred) must take all reasonable steps on their land to avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner. This includes controlling noxious weed species.

(viii) Road Management Act

Rokewood-Shelford Road, Rokewood-Skipton Road and Colac-Ballarat Road are declared arterial roads under the *Road Management Act 2004*. Changes to the arterial roads required to access the site will require the consent of VicRoads. The Golden Plains Shire Council is the road manager for open municipal roads within and adjoining the site. Any changes to, or upgrades of, those roads will require the consent of Council.

(ix) Water Act

The *Water Act 1989* (Water Act) provides the legal framework for managing Victoria's water resources, and applies to management of surface water and groundwater resources. The Planning Application Report noted that the Project will require a significant volume of water for construction and a lesser volume of water for ongoing operation and maintenance. Licences are required under the Water Act to extract water from a waterway.

3.2 Planning policy framework

The planning policy framework is largely set out in the Golden Plains Planning Scheme. Amendment VC148 took effect on 31 July 2018, on the first day of the Hearing. VC148 introduced a new integrated Planning Policy Framework into the Golden Plains Planning Scheme (and all other Victorian schemes), and changed the location of certain aspects of the former State Planning Policy Framework. Accordingly, some of the references to parts of the former State Planning Policy Framework in the EES main report, the Permit Application main report and submissions are outdated. This Report refers to the new (post-VC148) clause numbers.

(i) Integrated Planning Policy Framework

Clause 12.01 (Biodiversity) seeks to assist in the protection and conservation of Victoria's biodiversity. It seeks to ensure that decision making takes into account the impacts of land use and development on Victoria's biodiversity, including consideration of cumulative impacts and the fragmentation of habitat.

Clause 12.05 (Significant environments and landscapes) seeks to protect and conserve listed State significant environmentally sensitive areas. **Clause 12.05-2R (Landscape – Central Highlands)** includes a strategy of providing clear urban boundaries and maintaining distinctive breaks and open rural landscapes between settlements.

Clause 13 (Environmental risks and amenity) provides that planning should (among other things):

- aim to avoid or minimise natural and human-made environmental hazards, environmental degradation and amenity conflicts

- identify and manage the potential for the environment and environmental changes to impact on the economic, environmental or social wellbeing of society
- prepare for and respond to the impacts of climate change.

Clause 13.01 (Climate change impacts) seeks to minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning.

Clause 13.04-3S (Salinity) seeks to minimise the impact of salinity and rising water tables on land uses, buildings and infrastructure in rural areas, and reduce salt load in rivers. Strategies including preventing inappropriate development in areas affected by groundwater salinity.

Clause 14.01-1S (Protection of agricultural land) seeks to protect the state's agricultural base by preserving productive farmland. Strategies include:

- avoid permanent removal of productive agricultural land from the state's agricultural base
- protect productive farmland that is of strategic significance in the local or regional context
- consider the impacts of a proposed use or development on the continuation of primary production on adjacent land, with particular regard to land values and the viability of infrastructure for such production
- consider the compatibility between a proposed development and the existing use of the surrounding land
- consider the potential impacts of land use and development on the spread of plant and animal pests from areas of known infestation.

Clause 14.01-2R (Agricultural productivity – Geelong G21) seeks to support new opportunities in farming and fisheries.

Clause 14.03-1S (Earth and energy resources) seeks to encourage exploration and extraction of natural resources in accordance with acceptable environmental standards.

Clause 15.02-1S (Energy and resource efficiency) seeks to encourage land use and development that is energy and resource efficient, supports a cooler environment and minimises greenhouse gas emissions.

Clause 19.01-1S (Energy supply) seeks to facilitate appropriate development of energy supply infrastructure. Strategies include:

- support the development of energy facilities in appropriate locations where they take advantage of existing infrastructure and provide benefits to industry and the community
- support transition to a low-carbon economy with renewable energy and greenhouse emission reductions including geothermal, clean coal processing and carbon capture and storage
- facilitate local energy generation to help diversify the local economy and improve sustainability outcomes.

Clause 19.01-2S (Renewable energy) seeks to promote the provision of renewable energy in a manner that ensures appropriate siting and design considerations are met. Strategies include:

- facilitate renewable energy development in appropriate locations

- develop appropriate infrastructure to meet community demand for energy services
- consider the economic and environmental benefits to the broader community of renewable energy generation while also considering the need to minimise the effects of a proposal on the local community and environment
- recognise that economically viable wind energy facilities are dependent on locations with consistently strong winds over the year.

(ii) Local Planning Policy Framework

Clause 21.01 (Municipal profile) states:

The Shire contains rich and diverse environmental, cultural and scenic landscapes including granite outcrops, deeply incised river valleys and wide open volcanic plains. These landscapes include post contact features including goldfields and station homesteads.

Under “Key issues and influences” it states:

The Shire is characterised by agricultural land used predominantly for grazing and cropping as well as other activities including intensive animal industries and wind farms. There are a large number of small townships, natural forested areas, bushland areas and riverine gorges.

....

There are a limited range of employment opportunities within the Shire. It does not have large economic and service industries, and many of its residents travel outside the Shire for employment. The strength of the economy in adjoining municipalities is therefore important for the Shire’s residents.

Clause 21.01-3 (Vision and strategic framework) states:

As outlined in the Council Plan, Golden Plains Shire is a developing municipality that offers a lifestyle and opportunities that foster social, economic and environmental wellbeing.

Land use and development will be sustainably managed. Residential development will predominantly be contained within townships.

The natural environment will be protected and enhanced.

The local economy will grow, particularly in township development and rural based and farming industries.

Clause 21.03 (Environment and natural resources) states that key challenges facing the Shire include:

- managing threatening processes acting on the natural environment
- balancing native vegetation conservation with development pressures, land use change and protecting people from wildfire
- supporting the sustainable management of land and water resources
- minimising and managing the effects of flooding.

Clause 21.03-1 (Biodiversity) notes that the municipality is home to “a wealth of flora and fauna, including rare and threatened species and communities, major waterways and freshwater wetlands”. It states that the quality and quantity of native vegetation, flora and fauna across the municipality is threatened by development, land use change and poor land management practices. It also notes that projected changes in climate with increased temperatures and decreased precipitation will have wider impacts across environmental, social and economic aspects of the Shire.

Clause 21.03-3 (Salinity and soil) states that the municipality experiences salinisation of soil and water resources, which can have significant negative environmental, social and economic impacts. It notes the importance of new development and land use change protecting naturally saline waterways and wetlands, and appropriate risk management strategies to mitigate damage from salinity on the natural environment and built structures and infrastructure.

Clause 21.05-1 (Agriculture) states that agricultural industries are the major economic sector in the municipality, particularly extensive grazing and cropping. It includes an objective of ensuring that agricultural land is protected and used as an economically valuable resource.

Clause 22.11 (Floodplain Management) states:

The catchments of the various rivers and streams within Golden Plains Shire include areas of flood prone land where flooding has historically caused substantial damage to the natural and built environment. ... Floods are naturally occurring events and the inherent functions of the floodplains to convey and store floodwater should be recognised and preserved to minimise the long term flood risk to floodplain production assets and communities.

Clause 22.12 (Heritage) states that recognition and protection of heritage places and areas is a crucial component of planning in the municipality.

(iii) Victorian Wind Farm Guidelines

The *Policy and Planning Guidelines for Development of Wind Energy Facilities*, November 2017 (the Victorian Wind Farm Guidelines) set out guidance for proponents, decision makers and the community in relation to wind farm permit applications. They cover:

- selecting appropriate locations for wind energy development in Victoria
- the decision making framework for planning permit applications for wind farms
- information required to accompany an application for a wind farm permit
- the assessment of permit applications
- suitable permit conditions
- administration and enforcement of wind farm permits.

(iv) Regional Growth Plans

Following VC148, the regional growth plans are background documents listed in Clause 72.08 of the planning scheme. The site falls within two regional growth plans. The northern portion of the site is covered by the *Central Highlands Regional Growth Plan May 2014*, while the southern portion is covered by the *G21 Regional Growth Plan April 2013*.

DELWP Planning's Part A submission highlights relevant principles and key directions under the regional growth plans. Principles and directions under the Central Highlands Regional Growth Plan include:

- *The region's economy should be strengthened so that it is more diversified and resilient.*
- *Land use patterns, developments and infrastructure should make the region more self-reliant and sustainable.*
- *Planning for growth should be integrated with the provision of infrastructure.*
- *The region's land, soil, water and biodiversity should be managed, protected and enhanced.*
- *Long term agricultural productivity should be supported.*
- *The importance of cultural heritage and landscapes as economic and community assets should be recognised.*

Principles and directions under the G21 Regional Growth Plan include:

- *Maintain productive agricultural areas.*
- *Maintain and enhance natural assets.*
- *Provide land and infrastructure for existing and future employment nodes across the region to enable people to work within close proximity to home, to promote economic growth and support the development of agriculture and tourism.*

(v) Golden Plains Rural Land Use Strategy 2008

The *Golden Plains Rural Land Use Strategy 2008* identifies trends that are currently impacting on land use and communities within the Golden Plains Shire, including changes in agricultural practices, and the need for traditional farming to diversify with value adding practices.

3.3 Planning scheme provisions

(i) Zones, Overlays and particular provisions

The site is within the Farming Zone. Parts of the site are affected by the following overlays:

- Environmental Significance Overlay
- Land Subject to Inundation Overlay
- Salinity Management Overlay
- Vegetation Protection Overlay.

Three roads zoned Road Zone Category 1 affect the site. Rokewood-Shelford Road and Rokewood-Skipton Road partially abut the northern boundary, while Colac-Ballarat Road traverses the site.

Particular provisions relevant to the application include Clause 52.05 (Advertising signs), Clause 52.17 (Native vegetation), Clause 52.29 (Land adjacent to a Road Zone Category 1), Clause 52.32 (Wind energy facility) and Clause 52.33 (Post boxes and dry stone walls).

(ii) General provisions

Clause 65 of the planning scheme states:

Because a permit can be granted does not imply that a permit should or will be granted. The Responsible Authority must decide whether the proposal will produce acceptable outcomes in terms of the decision guidelines of this clause.

Clause 65.01 requires the Responsible Authority to consider, as appropriate:

- the matters set out in section 60 of the PE Act
- the Planning Policy Framework
- the purpose of the zone, overlay or other provision
- the orderly planning of the area
- the effect on the amenity of the area
- factors likely to cause or contribute to land degradation, salinity or reduce water quality
- the extent and character of native vegetation, the likelihood of its destruction, and whether it can be protected, planted or allowed to regenerate
- the degree of flood, erosion or fire hazard associated with the location of the land and the use, development or management of the land so as to minimise any such hazard.

(iii) Operational provisions

Clause 71.02-3 (Integrated decision making) (formerly Clause 10.01 in the State Planning Policy Framework) states as follows:

Society has various needs and expectations such as land for settlement, protection of the environment, economic wellbeing, various social needs, proper management of resources and infrastructure. Planning aims to meet these needs and expectations by addressing aspects of economic, environmental and social wellbeing affected by land use and development.

Planning and responsible authorities should endeavour to integrate the range of planning policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations. However, in bushfire affected areas, planning and responsible authorities must prioritise the protection of human life over all other policy considerations.

Planning authorities should identify the potential for regional impacts in their decision making and coordinate strategic planning with their neighbours and other public bodies to achieve sustainable development and effective and efficient use of resources.

3.4 Other relevant policy

(i) Commonwealth and State Government targets

In December 2015, the Commonwealth Government signed the Paris Agreement under the United Nations Framework Convention on Climate Change. Under the Paris Agreement, the

Commonwealth Government has committed to reduce national greenhouse gas emissions by 26-28 per cent on 2005 levels by 2030.

The Victorian Government has set renewable energy targets which are legislated in the *Renewable Energy (Jobs and Investment) Act 2017*. The targets are:

- 25 per cent (up to 1500 MW of new large-scale energy capacity) by 2020
- 40 per cent (up to 5400 MW of new large-scale energy capacity) by 2025.

The Victorian Renewable Energy Targets are supported by a competitive reverse auction scheme designed to deliver the targets, support capital expenditure of around \$9 billion in renewable energy projects in Victoria, and create up to 11,000 construction jobs over the life of the scheme, particularly in regional Victoria.

(ii) Victoria's Regional Statement

Victoria's Regional Statement *Your Voice, Your Region, Your State* (November 2015) notes the significant job opportunities from new energy industries that will drive the transition of Victoria to a low carbon economy. It notes that the Renewable Energy Roadmap will set out the government's plan for accelerating development of renewable energy generation in Victoria to reduce emissions, create jobs and put downward pressure on energy prices.

(iii) Victoria's Renewable Energy Roadmap

The Victorian Government released *Victoria's Renewable Energy Roadmap – Delivering jobs and a clean energy future* in August 2015. The Roadmap states:

It is the Victorian Government's objective to accelerate development of renewable energy generation in Victoria to reduce emissions, create jobs, and put downward pressure on energy prices.

The Roadmap sets out the government's plan to attract renewable energy investment and jobs, and to accelerate the development of renewable energy projects in Victoria. The Roadmap identifies four priority areas:

- transforming Victoria's generation stock towards renewable energy
- addressing barriers to distributed generation and storage
- encouraging household and community renewable generation
- expanding the Government's role in facilitating the uptake of renewable energy.

(iv) New Energy Technologies Sector Strategy

The *New Energy Technologies Sector Strategy: Victoria's Future Industries* (March 2016) is the Victorian Government's plan to transition to a low carbon economy. New energy technologies, which include forms of renewable energy, are a key part of this transition. The Strategy recognises the role that wind energy plays in the transition:

Around 12 per cent of Victoria's electricity generation comes from renewable sources such as wind, solar and bio-energy. There is potential for renewable energy to meet a greater share of our energy needs in the future, contribute new jobs, and increase the state's economic prosperity.

To better unlock this potential, we will implement industry development plans to support Victorian-based renewable energy sectors. These plans will support the growth of bio-energy and marine energy, with the potential to expand to other industries as they emerge.

The Strategy outlines four goals in relation to clean energy generation:

- *Deliver a clear and focused Renewable Energy Action Plan*
- *Attract investment and facilitate access to new capital*
- *Facilitate renewable energy projects and technologies in Victoria*
- *Develop emerging energy industries.*

(v) Victoria's Renewable Energy Action Plan

Victoria's Renewable Energy Action Plan, released in July 2018, builds on the *New Energy Technologies Sector Strategy*. It outlines 23 government actions to encourage investment in renewable, affordable and reliable energy. The actions include setting renewable energy targets, investing in renewable energy projects, establishing statutory authorities to help the transition to renewable energy generation, and delivering a more flexible approach to grid connections.

Action 6 is particularly relevant to wind farms:

... We are also introducing changes so new wind farm applications will need to have noise assessments and noise management plans reviewed and verified by environmental auditors appointed under the EPA's statutory environmental audit system. This reform will give the community and industry greater assurance that wind energy facilities will be designed and constructed to achieve compliance with the relevant noise standards.

Action 6 has largely been implemented, including through the November 2017 updates to the Victorian Wind Farm Guidelines.

PART B: ASSESSMENT OF ENVIRONMENTAL EFFECTS AND SUBMISSIONS

4 Brolga

4.1 Introduction

(i) EES evaluation objective

The EES scoping requirements set the following evaluation objective:

- *To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.*

(ii) Relevant policies and standards

Brolga Guidelines

The *Interim guidelines for the assessment, avoidance, mitigation and offsetting of potential wind farm impacts on the Victorian Brolga population*, DSE 2011, Revision 2012 (Brolga Guidelines) set out the process for investigating and mitigating potential impacts of wind farms on Brolga. The Brolga Guidelines indicate that wind farms impact on Brolgas in three ways:

- direct effects, particularly mortality as a result of collision with turbines
- indirect effects, including habitat avoidance
- barrier effects.

The Brolga Guidelines recommend a three step assessment approach:

- **Level one assessment** – Initial Risk Assessment (desk top studies of known potential habitat, site inspection, community consultation and landowner surveys within 10 kilometres of the wind farm boundary to determine the presence of Brolgas).
- **Level two assessment** – Impact Assessment (breeding and non-breeding season surveys incorporating one or more of aerial surveys, roaming surveys and flight behaviour surveys).
- **Level three assessment** – Mitigation and Offset (avoid impacts, collision risk analysis, Population Viability Analysis, compensation strategies).

In summary, the Brolga Guidelines aim to:

- remove impacts from flocking and nesting home ranges through turbine free buffers, to avoid any significant reduction in breeding success and to exclude any significant impact on the survivorship of Brolgas while occupying a flocking site
- develop a site-specific collision risk model for Brolgas
- model the risk to the Brolga population through Population Viability Analysis
- mitigate the estimated Brolga loss to produce a zero net impact on the Victorian population.

The Brolga Guidelines require a default buffer of 3.2 kilometres around Brolga breeding sites. Reduced buffers must be informed by site-specific investigations of Brolga activity. The Proponent proposes 700 metre buffers around breeding sites (consisting of a 400 metre buffer plus a 300 metres disturbance buffer), based on the site-specific investigations outlined in the Brolga Impact Assessment.

(iii) Background

Chapter 11 of the EES main report deals with impacts on Brolga. The Brolga Impact Assessment by Brett Lane & Associates (BL&A) is contained in Technical Appendix F1. Ian Smales of Biosis peer reviewed the Brolga Impact Assessment. The Peer Review is contained in Technical Appendix F2.

The Proponent called Mr Lane (author of the Brolga Impact Assessment) and Mr Smales (author of the peer review) to give expert evidence. Their expert witness statements are Documents 46 and 50.

The issues are:

- issues with the Brolga impact assessment:
 - the assessment approach
 - the reliability of the collision risk modelling
 - the adequacy of the survey work
 - alternative buffers
 - population viability assessment analysis
- other issues, including the terminal station, overhead powerlines and the Brolga Compensation Plan.

4.2 Overview of the Brolga Impact Assessment

The Brolga Impact Assessment concludes that given the small number of infrequently used breeding sites within the Project site, the risk to the Victorian Brolga population may not be significant.

(i) The assessment approach

The assessment approach is documented in Appendix 1 of the Assessment. BL&A compiled historical information from a number of sources including the Victorian Biodiversity Atlas, Birdlife Australia and discussions with local landowners. It conducted an historical analysis of breeding records within 10 kilometres of the wind farm boundary, and identified potential breeding and flocking sites that could be impacted by the Project. It modelled the collision risk of the proposed turbine layout, and removed the highest risk turbines until an acceptable mortality rate (based on the mortality rate for the Dundonnell Wind Farm) was achieved. The buffers were then determined and informed by (among other things) the collision risk modelling.

(ii) Breeding and flocking sites

BL&A initially identified 31 potential breeding sites within a 10 kilometre radius of the Project site (the investigation area or the Radius of Investigation). This was subsequently reduced to 26 breeding sites, as several of the breeding records were considered too far from wetlands due to inaccurate coordinates. Three breeding sites are located within the Project site, 16 are within 5 kilometres of the site and seven are between 5 and 10 kilometres.

Breeding Season Surveys were undertaken from September to December 2016 and July to December 2017. A breeding season aerial survey was conducted over 3 days in November and December 2016. According to these surveys, nine wetlands were used for breeding in

2016 and seven wetlands were used for breeding in 2017. The maximum number of breeding Brolga pairs detected simultaneously was eight.

Historical analysis of flocking records identified one traditional flocking site at Lake Weering, approximately 9 kilometres southwest of the Project site. Flocking season surveys were undertaken during January to May 2017, and January to April 2018. No traditional flocking sites were found within 5 kilometres of the Project site, or within the site itself. Five one-off flocking sites have been recorded within the investigation area.

As no flocking sites occur within 5 kilometres of the proposed wind farm, avoiding and mitigating impacts focused on the breeding sites. The Brolga Impact Assessment states that no breeding activity was observed within 3.2 kilometres of the Project site in the 2016 breeding season. In 2017, breeding Brolgas were observed at two wetlands (an adult pair and one juvenile, and an adult pair and two juveniles). BL&A did not undertake statistical home range mapping, as data from two nests was considered insufficient to develop definitive home range maps.

(iii) Project layout and turbine free buffers

The turbine free buffers have been defined by identifying and moving or removing high risk turbines, through iterative collision risk modelling analysis. The following factors have contributed to defining the buffers:

- Higher risk turbines were removed or moved in the southwest part of the wind farm to avoid an area of concentrated Brolga activity related to a cluster of confirmed breeding sites.
- Turbine free corridors of at least 1.5 kilometres wide have been provided between two breeding sites within the wind farm to allow unobstructed access to some wetlands outside the wind farm site.
- Higher collision risk turbines close to three breeding sites (15, 16, 25) were removed or moved to at least 700 metres.
- Through these modifications to the turbine layout, the total predicted collision risk of the Project was reduced to a level less than previously approved for Dundonnell wind farm.

As well as the collision risk modelling, the final proposed turbine layout and the (minimum) 700 metre buffer is informed by:

- observational studies of Brolga flights from other breeding sites in southwest Victoria (this information is presented in Appendix 3 of the Brolga Impact Assessment)
- observations at Macarthur wind farm since 2012, where Brolga have been observed breeding and utilising the landscape within the wind farm boundary
- breeding site home range mapping published in EES referrals for the Peshurst and Mount Fyans wind farms.

Table 9 of the Brolga Impact Assessment records the distance to the nearest turbine for each breeding site. For 13 of the 26 breeding sites assessed, the nearest turbine is at least 3.2 kilometres away. For the remaining breeding sites:

- nine are at least 1.4 to 3.2 kilometres from the nearest turbine
- two (wetlands 15 and 16) are at least 800 metres and 900 metres respectively from the nearest turbine

- two (wetlands 17 and 25) are at least 700 metres from the nearest turbine.

(iv) Collision risk analysis and population viability analysis

The Brolga Impact Assessment explains the methodology for the collision risk modelling and the Population Viability Analysis (PVA) in Appendix 5.

Collision risk modelling for the final proposed turbine layout predicts between 8 and 9 Brolgas are likely to be killed from a collision over the 25 year life of the Project (based on a 90 per cent avoidance rate).

The PVA was conducted on the basis of an expected minimum population of 807 birds. The PVA predicts that without compensation, at the end of the life of the Project, the population size will be between 806.6 (based on an assumption of 99 per cent avoidance) or 802.6 (based on 90 per cent avoidance). A compensation plan is proposed to achieve zero net impact.

In response to EES Submission 15 and after consultation with the landowner, one additional wetland (wetland 27) was included as a breeding site. The collision risk modelling was updated to include this site. The results are contained in Appendix 5 of Mr Lane's expert witness statement (Document 46). The updated modelling predicts 9.3 Brolgas will be killed from a collision over the life of the project (based on 90 per cent avoidance).

4.3 The assessment approach

Ordinarily, collision risk modelling for wind farms is used to estimate any remaining and unavoidable risk after turbine free buffers had been applied. In this case, collision risk modelling was undertaken before the application of turbine free buffers, and was used to inform the buffers. The Brolga Impact Assessment indicates that this approach was agreed with DELWP Environment from the outset, because it was recognised that the application of more traditional buffer mapping methods (such as the default 3.2 kilometre buffer set out in the Brolga Guidelines and the application of the BL&A habitat model) would have a profound effect on the Project layout (number of turbines).

(i) Evidence and submissions

Submitters, including Regional Victorians OTDS and Mr Cumming, pointed to the declining population of Brolga due to threats such as foxes and other predators, climate change and drying conditions. They submitted that this calls for a cautious approach, and that it is important not to add to this decline through further Brolga mortalities from the wind farm.

Mr Lane's evidence was that the assessment approach was agreed with DELWP Environment at the outset. His evidence was that the approach was consistent with the three level assessment outlined in the Brolga Guidelines. Mr Smales concluded that the Brolga Impact Assessment is consistent with the requirements of all the three levels of assessment outlined in the Brolga Guidelines.

DELWP Environment confirmed that it had agreed to an iterative modelling approach to achieve a zero net loss target as close as practicably possible. However, it had several concerns with the outcomes of the Assessment, which are addressed in subsequent parts of this Chapter. DELWP Environment also submitted that the cumulative impact on the Brolga

population should be considered to manage population risk, rather than the modelled impact of the Project on its own.

The Panel questioned Mr Lane as to whether he considered that the cumulative impacts of the Project and other wind farms in the area had been appropriately assessed. His response was that the Brolga Guidelines require each wind farm development to achieve zero net impact on the Brolga population, with an overall objective to avoid cumulative impacts of multiple wind farms. There should therefore be no cumulative impacts.

(ii) Discussion

The Panel notes that the Brolga Impact Assessment was undertaken generally in accordance with the three step process outlined in the Brolga Guidelines, and followed the assessment approach agreed with DELWP Environment. However DELWP Environment has not agreed with all the results from the Brolga Impact Assessment. It has raised a number of concerns in relation to the Assessment, and questioned some of the conclusions reached. The Panel considers that while there was agreement on the initial approach, it does not bind DELWP Environment to the outcome. In any event, the Panel has a responsibility to evaluate the results of the Brolga Impact Assessment and provide independent advice.

Cumulative impacts may arise from displacement from habitat and barrier effects to seasonal or local flights. Information provided from the Macarthur wind farm referred to in the Assessment suggests Brolga utilise the wind farm site for foraging and have attempted breeding within the site. The Panel considers that these observations form a limited basis for understanding barrier and displacement effects of wind farms.

The Brolga Guidelines require each wind farm development to achieve zero net impact on the Brolga population with an overall objective to avoid cumulative impacts on multiple wind farms operating independently. The Proponent has committed to achieve zero net impact through the implementation of a Brolga Compensation Plan. This is discussed in more detail below.

4.4 The reliability of the collision risk modelling

The collision risk modelling was undertaken by BL&A, using mathematical calculations provided by Symbolix. The BL&A collision risk model used two components:

- An estimate of movement of Brolga within the site, based on predicted activity levels of Brolga around breeding sites. Symbolix converted the Brolga activity levels to a probability distribution of Brolga across the wind farm site.
- An estimate of the interaction of Brolga with turbines, using the collision risk model for a range of potential avoidance rates to generate collision risk.

(i) Evidence and submissions

Modelling results

The results of the collision risk modelling for the Proponent's proposed final turbine layout were presented in Document 49. They are based on 228 turbines, a rotor swept area of 40 to 190 metres above ground level, and a 150 metre diameter. The results have been updated to include wetland 27. The annual results are summarised in Table 1 below.

Table 1: Annual collision risk based on exhibited turbine layout

Avoidance rate	90%	95%	99%
Modelled long term average annual Brolga collision rate (breeding)	0.238	0.119	0.024
Modelled long term average annual Brolga collision rate (flocking)	0.133	0.066	0.013
Modelled annual power line Brolga collision rate	0.001	0.001	0.001
TOTAL	0.372	0.186	0.038

The annual results translate to the loss of between less than one bird (99% avoidance) and less than ten birds (90% avoidance) over the 25 year life of the Project.

Document 49 compares the predicted annual collision impact for the Project with the approved Dundonnell Wind Farm. This comparison is presented in Table 2.

Table 2: Comparison of collision risk for Dundonnell and Golden Plains wind farms

Avoidance rate	Dundonnell Wind Farm			Golden Plains Wind Farm		
	90%	95%	99%	90%	95%	99%
TOTAL modelled long term average annual Brolga collision rate (turbines and power lines)	0.95	0.5	0.13	0.372	0.186	0.038

Document 49 concludes that the per turbine rate of collision (at the 90% avoidance rate) for the Project is 0.0018, or about 20 per cent of the predicted collision rate for the Dundonnell wind farm. Mr Lane considered the approved Dundonnell wind farm is a benchmark in terms of the scale of impact of wind farms in Victoria, and by comparison the predicted impact of the Project is much less.

Modelling methodology

Submitters queried the accuracy of the collision risk modelling. They were concerned that the modelling does not take into account factors such as poor visibility conditions, or Brolga behaviour (for example, flying close together as a pair or family, or longer distance flights leading up to egg laying, training flights with fledglings or Brolgas ‘tacking’ into the wind).

DELWP Environment submitted that there are uncertainties associated with the collision risk modelling, as the inputs rely on estimates and assumptions, and are based on data collected from other areas in southwest Victoria. Data collected from the Project site was limited. In response to questions from the Panel, DELWP Environment indicated that it does not have expertise in modelling and does not have a view on the model (Document 101). Its current position is that any peer review of a collision risk model should be completed by a qualified and independent expert.

Relying on the evidence of Mr Lane and Mr Smales, the Proponent submitted that the model makes a number of conservative assumptions, such as:

- all flights enter a sphere around turbine blades which interacts with the full face of the blades
- birds killed are immediately replaced

- turbines operate 24 hours per day, 365 days per year.

It submitted that while the model contains mathematical analysis that is highly technical it is far from novel, and the Panel should have confidence in the reliability of the model and in the manner in which the modelling has been undertaken.

Mr Lane indicated that the collision risk modelling used two techniques:

- widely used spatial statistical methods published in peer reviewed journals to determine the probability of occurrence of a flying Brolga at any point on the wind farm using flight behaviour data
- the peer reviewed and widely used (in Australia and the Northern Hemisphere) Band wind turbine collision risk model.

A detailed explanation of the turbine bird collision risk model used by BL&A in the Brolga Impact Assessment (BL&A Band) is provided in the Appendix 5 of the Assessment. Mr Lane's evidence was that the BL&A Band model has been designed to accept spatial inputs to generate probability density maps (heat maps) that allow for the probability of collision risk with turbines to be differentially calculated throughout the wind farm, rather than assuming each turbine has an equal probability of collision. This allows the annual collision rate for each turbine to be identified, and to thereby identify high risk turbines.

Mr Smales' evidence was that prior to the operation of the wind farm, the level of potential impact and of mitigation measures can only be evaluated on the basis of informed prediction and experience at operational wind farms in similar environments. His view was that the methods used in the collision risk modelling are consistent with the methods set out in the Brolga Guidelines. In response to questions from the Panel, Mr Smales stated while the input values to the modelling had been based on agreed assumptions, he had not reviewed the mathematics of the modelling.

(ii) Discussion

The Panel devoted considerable time to assessing the collision risk modelling. It was assisted by the Proponent providing additional written information in response to questions from the Panel, and access to Dr Elizabeth Stark from Symbolix during the Hearing.

The mathematical and probabilistic analysis in the modelling is highly technical. While there is a body of knowledge on aspects of Brolga behaviour, there is no empirical data on the behaviour of Brolga and their avoidance of turbines. Brolga collision risk modelling has not been validated, as there have been no documented Brolga mortalities due to turbine collisions to date in Australia. For these reasons, the Panel considers that mathematical approximation of real world behaviour of Brolga and modelled predictions must be treated with caution.

It is clear from submissions that communication of the model to stakeholders and its application to Brolga assessment is problematic, perhaps due to the mathematical language barriers inherent in the model design. For stakeholders, this creates doubt and concern about the accuracy of the predictions and a lack of confidence in decisions based on the modelling. The Panel considers that this can only be addressed by monitoring and reporting Brolga impacts at wind farms, to provide data for validation, clarify the limits and approximations in the model, and clarify the uncertainties in the predictions.

4.5 The adequacy of the survey work

(i) Evidence and submissions

Several submissions raised concerns over the adequacy of the survey work undertaken to support the Brolga Impact Assessment. Submitters said that surveys were undertaken at the wrong time of year, from too far away and for too short a time. The surveys had failed to identify all of the Brolga breeding sites in the area (for example wetland 27 on the Waltons property had been missed).

Mr Pikusa, for the Waltons, urged caution in relying on historical breeding records. He submitted that most local landowners were unaware that there was a Brolga register to report Brolga breeding events, which would explain the large gaps in historical data of Brolga within the area. Many local landowners submitted that they regularly observe Brolga within and around the Project site, although Brolga activity varies depending on seasonal conditions. Mr Pikusa submitted that the historical data dramatically understates the observations of Brolga in the area.

DELWP Environment submitted that the site-specific home range data presented in the Brolga Impact Assessment is generalised from limited observations of two breeding pairs in one breeding season. The small sample size and the single year of data fails to capture variation between years, and does not meet the threshold test of a providing a high level of confidence that a reduction in the default 3.2 kilometre buffer is justified. DELWP Environment also raised concerns that a medium to high quality wetland suitable for Brolga breeding (Baths Swamp) had not been identified by the survey work as a potential breeding site, and had accordingly not been included in a turbine free buffer.

In response, Mr Lane stated that although the Brolga Guidelines seek to obtain site-specific information on Brolga movements at a wind farm site, experience indicates that this is impractical, particularly given the sporadic use of individual wetlands by Brolga.

Mr Smales referred to Brolga breeding home range mapping undertaken by Biosis for the Penshurst and Mount Fyans Wind Farms. The Biosis home range mapping was based on intensive site-specific home range surveys undertaken during incubation and brooding, and some post hatching, at several nest sites over a period of several months. The Biosis home range mapping resulted in a recommendation of turbine free buffers at Mount Fyans with a total radius of approximately 1,135 metres for each breeding site. Details of the Biosis home range mapping project are contained in the Mount Fyans Wind Farm Brolga Assessment (Document 81). DELWP Environment supported the Biosis home range mapping, and the proposed 1,135 metre buffers, at Mount Fyans.

The Panel asked Mr Smales whether the data underpinning the Biosis home range mapping was able to be applied with confidence to other wind farm sites. He suggested that it may be valid to apply the Mount Fyans home range data at Golden Plains (because of the rigor of data collection at Mount Fyans), but he expressed caution in so doing. If initial assessments showed that the two sites are statistically different, a site-specific approach is preferred.

The Panel sought clarification from DELWP Environment concerning Baths Swamp (wetland 54032). DELWP Environment indicated that while no records of Brolga breeding were confirmed for the site, it thought that the landowner had not been surveyed in relation to

Brolga activity. As the wetland appeared to be suitable for breeding, a precautionary approach to protecting Brolga should be applied and it should be included in a buffer.

The Proponent responded that a site buffer was not applied to Bath Swamp as there is no breeding record for Baths Swamp. The Proponent submitted that the landowner had in fact been surveyed, and produced a copy of the landowner's response (Document 95), which confirmed that the landowner had not observed any Brolga breeding activity at Baths Swamp.

(ii) Discussion

The Panel agrees with DELWP Environment that the site investigations undertaken by BL&A do not meet the threshold test in the Guidelines of providing a high level of confidence that a reduction in the default 3.2 kilometre buffer to 700 metres is justified.

The amount of field survey work undertaken at Golden Plains was significantly less than that undertaken at recent wind farms, including Peshurst, Mount Fyans and Dundonnell. The Proponent submitted that birds that are not there cannot be surveyed. Equally, if inadequate survey work is done, birds that are present will not be identified and recorded.

Site investigation at Golden Plains involved observations at two nest sites over a period from October to December, with total observation time between 4 and 9.7 hours per nest. The Brolga Impact Assessment concludes that there was insufficient data collected to develop definitive breeding home ranges for this site.

By contrast, the breeding home range investigations at Peshurst and Mount Fyans involved visiting breeding sites as many times as possible from dawn to dusk, leaving at least 2 hours between sequential observations. At Peshurst the observations at three breeding sites were conducted over 17 days in total. At Mount Fyans the observations at five breeding sites were undertaken over a total of 29 days. This level of investigation provided a comprehensive data set on which to establish the breeding home range and inform the turbine free buffering process at those sites.

At Dundonnell – a site with five breeding sites within 3.2 kilometres and seven traditional flocking sites within 5 kilometres – some 3,700 hours of specific site investigation was undertaken.

The Panel does not accept Mr Lane's evidence that obtaining specific information on Brolga movements at a wind farm site is impractical. This is precisely the approach taken by Biosis at Mount Fyans and Peshurst. The Biosis approach generated sufficient empirical information to provide a high degree of confidence that a reduced buffer is appropriate.

The Panel accepts the evidence that there are no breeding records for Bath Swamp, and agrees that it should not be considered as a breeding site for this assessment.

(iii) Findings

The Panel finds:

- The site investigations undertaken by BL&A do not meet the threshold test in the Guidelines of providing a high level of confidence that a reduction in the default 3.2 kilometre buffer to 700 metres is justified.

- Baths Swamp has no breeding records, therefore should not be considered as a breeding site for the purposes of the Brolga Impact Assessment.

4.6 Alternative buffers

(i) Evidence and submissions

Submitters said that the default buffer of 3.2 kilometres should be applied to breeding sites. They submitted that the survey work was not adequate to justify reducing the default buffers, and that buffers should include all suitable wetland habitat within 3.2 kilometres of a breeding site. Submitters were also concerned about the absence of turbine free flight corridors through the wind farm. Submitters observed that Brolgas often fly into dry paddocks to eat and forage, and did not always fly from wetland to wetland. They submitted that flight corridors should be provided that take this into account.

DELWP Environment did not support the proposed 700 metre buffers. DELWP Environment's submission (Document 71), and further written clarification to the Panel on the breeding site buffers (Documents 72 and 101), indicated (in summary):

- Unless site-specific investigations can show with a high level of confidence the size and shape of home ranges for a project, the default home range should be used.
- The site-specific home range size presented by the Brolga Impact Assessment is generalised from limited observations of two breeding pairs in one breeding season. The small sample size and the single year of data fails to capture variation between years, and does not meet the threshold test of a high level of confidence.
- Other data provided to justify the reduced buffer included flight distances observed from breeding wetlands in other locations in southwestern Victoria. 38 per cent of the flights observed were greater than 700 metres, with the greatest observed distance flown from a breeding site being 3.2 kilometres.

DELWP Environment concluded that it did not have sufficient information on which to base an alternative buffer.

DELWP Environment also raised concerns that proposed turbine free corridors are not aligned with anticipated Brolga movements through the site, but when asked by the Panel whether it had information in relation to anticipated flight paths, it indicated that it did not have this information.

Two wetlands (wetlands 15 and 16) are proposed to have a 700 metre buffer. Mr Lane indicated that the 700 metre buffers encompass a potential home range of 323.8 hectares for wetland 15, and 279.3 hectares for wetland 16. He referred to new information from Ms Veltheim, a PhD candidate who undertook detailed investigations of Brolga movements in south-western Victoria, indicating that:

- breeding site home range averages of 228 hectares (51 to 521 hectares)
- average distance of movements are 442 metres.

Mr Lane concluded that based on this new information from Ms Veltheim, the default 3.2 kilometre buffer required under the Brolga Guidelines is "*clearly now redundant*".

The Panel questioned Mr Lane on whether this new information was published, and whether the statement regarding the redundancy of a 3.2 kilometre buffer was the conclusion of the

author from her doctoral studies. Mr Lane advised that the conclusion was his opinion, not Ms Veltheim's, and it was based on information presented by Ms Veltheim which is "*in a public forum*".

Mr Smales observed that a 700 metre buffer was smaller than the buffers proposed for any other wind farm in Victoria. He stated that the empirical basis for understanding the influence of buffer distances remains limited.

The Panel requested the Proponent to prepare five plans to illustrate alternative buffers:

- the Proponent's proposed final turbine layout – minimum 700 metre buffers (Document 83)
- 1000 metre buffers, which DELWP Environment requested the Proponent to model during the course of the EES exhibition process (Document 84)
- 1,135 metre buffers based on the Biosis home range mapping for Peshurst and Mount Fyans wind farms (Document 85)
- BL&A habitat model buffers (Document 86)
- the default 3.2 kilometres set out in the Brolga Guidelines (Document 87).

(ii) Discussion

The Panel understands that the BL&A habitat model defines the breeding home range as a polygon, calculated as follows:

- a 400 metre radius around the breeding wetland site
- all wetlands within 3.2 kilometres from a breeding site are identified and included in the mapped home range buffer
- a further 300 metre disturbance buffer is placed around this home range.

BL&A habitat model buffers have been applied to Brolga breeding sites on and around other wind farms in Victoria, including Dundonnell and Stockyard Hill. Table 3 compares the number of turbines removed, and the impacts on Brolga, in each of the buffer scenarios. The impacts on Brolga are derived from collision risk modelling assuming a 90 per cent avoidance rate. The information in Table 3 is derived from Documents 90 and 91.

Table 3: Turbines and Brolgas lost under different buffer scenarios

Buffer option	Turbines lost	Brolgas lost
No buffers	0	10.48
Final proposed turbine layout	20	9.25
Biosis average home range buffer	29	8.36
BL&A habitat model	67	5.75
Default 3.2 kilometre buffer	137	2.09

The Proponent submitted that its proposed buffers (700 metres) strike a reasonable balance between maximising renewable energy generation and avoiding and minimising impacts on Brolga. It submitted:

- application of the default buffer of 3.2 kilometres would result in the loss of an additional 117 turbines compared to its proposed buffers, which would impact the viability of the Project
- application of the BL&A habitat model buffer would result in the loss of an additional 47 turbines, representing a significant cost to the Project and a significant loss in broader community benefits including generation of 235MW of renewable energy
- application of the Biosis home range mapping approach for Penshurst and Mount Fyans had not been possible at Golden Plains, because “BL&A could not survey birds that were not there”.

The Proponent went on to add that it would be open to the Panel to apply the Biosis average home range buffers if it was not satisfied that the Proponent’s proposed buffers are appropriate.

In considering this approach, the Panel is cognisant of Mr Smales’ response to its questions about the transferability of the home range mapping data derived from one site to other locations. It is evident from his response (discussed in Chapter 4.5 above) that there would be some uncertainty in this approach. The Panel is not in a position to assess the comparative characteristics of the Project site, the Penshurst site and the Mount Fyans site. Further assessment would be required. The Panel is therefore cautious about simply applying the Biosis average home range buffers for Penshurst and Mount Fyans to the Project site, and considers that a bespoke buffer design based on site-specific information would be preferable.

4.7 Population Viability Assessment analysis

Population Viability Assessment (PVA) is a tool described in the Brolga Guidelines for understanding the population consequences of modelled wind farm impacts on Brolga. At the request of the Panel, BL&A provided a PVA analysis for each of the alternative buffer scenarios described in Chapter 4.6. The PVAs were based on two assumed starting populations:

- the population estimate based on the 2013 census (907 birds)
- the estimated population in the Brolga Guidelines, which pre-date the census (625 birds).

In addition, the Panel requested a PVA to be run assuming all of the 8 pairs of Brolga estimated to be occupying the Project site were killed in the first year, to demonstrate an absolute worst case.

PVAs were run for the different buffer alternatives, assuming a 90 per cent avoidance rate, a 95 per cent avoidance rate and a 99 per cent avoidance rate, and assuming no compensation. The results were provided in Document 90. The results based on the assumption of a 90 per cent avoidance rate (which is the most conservative worst case scenario) are summarised in the tables below.

Table 4: Estimated minimum population (EMP) under alternative buffer scenarios (initial population of 907 birds)

Buffer option	Baseline EMP after 25 years	EMP with project impact (% change)
Final proposed turbine layout	807.3	802.7 (0.58%)
Biosis average home range buffer	807.3	802.7 (0.57%)
BL&A habitat model buffer	807.3	804.5 (0.35%)
Default 3.2 kilometre buffer	807.3	806.3 (0.12%)
8 Brolga pairs lost over 25 years	807.3	799.3 (0.99%)
8 Brolga pairs lost in the first year	793.1	778.9 (1.790%)

Table 5: Estimated minimum population (EMP) under alternative buffer scenarios (initial population of 625 birds)

Buffer option	Baseline EMP after 25 years	EMP with project impact (% change)
Final proposed turbine layout	555.6	551.2 (0.79%)
Biosis average home range buffer	555.6	551.3 (0.77%)
BL&A habitat model buffer	555.6	552.5 (0.58%)
Default 3.2 kilometre buffer	555.6	554.3 (0.23%)
8 Brolga pairs lost over 25 years	555.6	547.6 (1.44%)
8 Brolga pairs lost in the first year	541.3	527.1 (2.623%)

The Proponent submitted that the PVA analysis indicates that the difference in the expected minimum population of Brolga at the end of the Project will be between 1 bird (with the default 3.2 kilometre buffers) and 4.6 birds (with the Proponent's proposed buffers). It submitted that the default buffers would result in a limited long term benefit for Brolga. This needs to be considered in the context of the low Brolga utilisation of the site, a proposed binding obligation to offset loss of Brolga, the resources that the Project will make available to landowners for predator control and land management improvements and the socio-economic consequences of removing large numbers of turbines.

The Proponent noted that the Biosis average home range buffer gave almost the exact same result in terms of estimated minimum population at the end of the life of the Project as the Proponent's approach. It noted that DELWP Environment supported the Biosis approach, yet it did not support the Proponent's approach despite it resulting in a similar estimated minimum population.

BL&A indicated that the estimated minimum population with the immediate loss of eight pairs of Brolga from the population from year one into the life of the Project, with no replacement or recruitment, is not realistic either in terms of the way the impact will occur or the way the Brolga population works.

4.8 The Panel's assessment of Brolga impacts

(i) Discussion

The Panel recognises that the Brolga Guidelines are neither incorporated nor referenced in the Planning Scheme. Nevertheless, they provide a policy framework and specific guidance for the assessment and mitigation of impacts on Brolga from wind farms.

The Panel accepts the analysis of the Brolga Impact Assessment that there are no traditional flocking sites within 5 kilometres of the wind farm or on the wind farm site itself. In the absence of demonstrated evidence of flocking sites within the vicinity of the Project site, the Panel agrees that the focus should be on breeding sites.

The key objective for breeding habitats set out in the Brolga Guidelines is to avoid significant reduction in breeding success. The Panel is guided by this objective in its consideration of appropriate buffers, and has applied an evidence-based approach in considering whether the alternative buffer scenarios are likely to achieve this objective.

The Brolga Guidelines recognise that Brolga breeding home ranges are likely to vary with local habitat quality and extent, and seasonal conditions. With this in mind the Guidelines contemplate the default 3.2 kilometre buffer being reduced, but only where site-specific investigations can show with a high degree of confidence the size and shape of home ranges for a project.

The Panel considers that a precautionary approach is required, because the empirical basis for understanding the influence of buffer distances on Brolga is limited. The Panel does not consider it valid or helpful in managing and mitigating potential impacts of wind farms on Brolga to compare modelled predicted collision rates between wind farms. The characteristics of each wind farm are unique, and the response to Brolga impact assessment must be treated on its merits at each location.

The following factors support adopting the buffer approach proposed by the Proponent:

- It is based on sufficient observations of Brolga flights in south western Victoria, which are not inconsistent with the (albeit limited) observations of nesting Brolga at the Project site.
- The modelled long term average annual collision rate at the Project site is much lower than that predicted for Dundonnell Wind Farm, which has been approved.
- Mr Lane's evidence that new research tends to suggest that a 3.2 kilometre buffer may be overly conservative.
- There will be a binding obligation on the Proponent to offset loss of Brolga to as to ensure a net zero impact.
- Given the small number of infrequently used breeding sites within the wind farm site, the risk to the Victorian Brolga population posed by the development may not be significant.
- Alternative turbine free buffer arrangements will have a profound effect on turbine layout, with little gain for Brolga.
- There will be significant benefits for Brolga resulting from the resources that the Project will make available to landowners for predator control and land management.

The following factors support an alternative turbine free buffer:

- There is uncertainty about the collision risk modelling and its predictions. The model has not been validated for Brolga at an operating wind farm in Victoria.
- The site-specific investigations and Brolga breeding home range mapping at the Project site is limited, and does not provide a high degree of confidence that reduced buffers are justified.
- The observation data on Brolga movements from southwestern Victoria utilised to establish the rationale for the buffer indicate that 38 per cent of the Brolga movements observed were greater than 700 metres, with some flights up to 3.2 kilometres.
- The proposed 700 metre buffer is the smallest proposed for a wind farm in Victoria and there is no evidence of its efficacy.

The Panel considers that there is considerable uncertainty as to whether the Proponent's proposed buffers will achieve the objectives of the Brolga Guidelines. While collision risk modelling is a valid tool to assess the risks to Brolga, collision risk modelling is uncertain. Model predictions have not been tested or validated at any operating wind farm. In other wind farm proposals, the uncertainty of the collision risk model predictions have been set against the precaution of either a default 3.2 kilometre buffer, a BL&A habitat model buffer or (in the case of Mount Fyans) a bespoke buffer based on intensive site investigations. This is not the case here. Here, the uncertainty associated with the model predictions is compounded by the uncertainty associated with a novel 700 metre buffer.

BL&A prepared the Brolga impact assessment for Dundonnell. In the absence of regular breeding activity in the vicinity of the wind farm, BL&A applied the BL&A habitat model. According to the Dundonnell Brolga impact assessment, in different years a pair of Brolga using the same site may behave differently if habitat conditions around a breeding site change. The Dundonnell Brolga impact assessment argued that the BL&A habitat modelling approach allows for possible differences in conditions and behaviour between years, and is therefore more likely to encompass the area used by a breeding pair over the life of the wind farm.

The Panel asked Mr Lane why the BL&A habitat model was not being proposed at Golden Plains, given the limited breeding observations available from the Project site and the absence of statistical home range mapping. Mr Lane indicated that the BL&A habitat model was a conservative approach and while it had been considered and assessed at Golden Plains, it would have a profound effect on the project layout.

The Panel places limited weight on Mr Lane's opinion that Ms Veltheim's South West Victoria Brolga Research Project work demonstrates that 3.2 kilometre buffers are redundant. The Panel understands that examination of her PhD thesis is in progress. As yet, the results of her work are unpublished. Only when the work is published can the results of her investigations be evaluated in context.

Having weighed up the various factors and considered the evidence, including the outcomes of the PVA analysis, the Panel finds that there is no empirical basis to support a reduced buffer of 700 metres. It does not consider that the information and evidence put forward by the Proponent in support of the reduced buffers meets the threshold test of a high level of confidence. On the basis of the evidence before it, the Panel is not satisfied that a 700 metre buffer will be effective in achieving the objectives of the Brolga Guidelines.

In the circumstances, the Panel is satisfied that the application of the BL&A habitat model should satisfy the Guideline's objectives. While a map of the BL&A habitat model buffers has been provided (Document 86), the Panel considers that the final boundaries of the turbine free polygons should be agreed by DELWP Environment.

The Proponent may choose to undertake further assessment and investigation of Brolga breeding activity and home range mapping at the Project site, to provide a more sound, empirical evidence base to support reduced buffers and the provision of additional turbines. This would require a future amendment to the permit, which could be assessed through an independent process.

(ii) Findings

The Panel finds:

- In the absence of site-specific investigations that provide a high degree of confidence that the Proponent's proposed 700 metre buffers are justified, turbine free buffers should be based on the BL&A habitat model polygons.

4.9 Other issues

(i) The terminal station

DELWP Environment raised concerns that a Brolga breeding wetland adjacent to the proposed terminal station (wetland 25) is to be partially cleared and infrastructure built adjacent to it. DELWP Environment submitted that the breeding wetland boundary should be taken to the edge of the Plains Grassy Wetland ecological vegetation class (EVC) as mapped in the vegetation assessment, rather than the DELWP mapped wetland layer boundary. Mr Lane responded to the effect that no vegetation clearance is proposed for this wetland.

The Panel agrees with DELWP Environment that the boundary for the wetland should be taken from the edge of the Plains Grassy Wetland EVC as mapped in the vegetation assessment. Brolga movements are likely not only in the wetland itself, but also around the surrounding vegetation. The final boundary of the terminal station site should be determined in conjunction with DELWP Environment. The Panel has included an appropriate condition in its recommended permit conditions in Appendix F.

(ii) Powerlines

A number of submitters identified the threat to Brolga posed by powerlines. In response to questions from the Panel (Document 101), DELWP Environment indicated that its current position is that siting of overhead powerlines should be consistent with default turbine buffers recommended in the Brolga Guidelines. DELWP proposes that all powerlines within 3.2 kilometres of a breeding wetland should be marked.

There is a substantial and accepted body of evidence that powerlines pose a risk to Brolga mortality. The Brolga Guidelines do not propose a buffer for powerlines, but rather support the marking of power lines to reduce collision risk. Rather than establish a default distance for powerline marking (as proposed by DELWP Environment), the Panel considers that all overhead powerlines within the turbine free buffers should be marked. The Panel has included an appropriate condition in its recommended permit conditions in Appendix F.

(iii) The Brolga Compensation Plan

A draft Brolga Compensation Plan has been prepared is contained in Appendix 7 to the Brolga Impact Assessment. This is a somewhat unusual approach, as Brolga Compensation Plans are generally left to approval by way of a secondary consent after the wind farm permit has issued.

Several submitters submitted that Brolga compensation plans have not been proven to be effective in achieving the Brolga Guidelines objective of no net loss of Brolga. They submitted that the permit should require the Proponent to accelerate the development of offset wetlands, and to demonstrate that milestones had been achieved, including through ongoing monitoring and adaptive management of these wetlands to ensure they are used by Brolgas in sufficient numbers.

DELWP Environment noted that the effectiveness of the proposed Compensation Plan in offsetting Brolga mortality is untested at this point in time. It raised a number of issues concerning the development and implementation of such a plan and identified proposed conditions to address these issues if a permit were to be granted.

The Panel supports the development and implementation of the Brolga Compensation Plan and notes that DELWP Environment will work with the Proponent to develop a mutually acceptable plan incorporating monitoring, evaluation and reporting procedures. A challenge in the implementation of such a plan is verifying recruitment gains to Brolga breeding stock and determining that the management actions that are being undertaken deliver the required additional recruitment over the 25 year period of the plan.

The Panel considers that while compensation planning associated with individual wind farms is important to deliver, regional action is required. Material presented by Mr Cumming suggests that there is a long term decline in the Victorian Brolga population. DELWP Environment needs to address what is happening at a population level, to gain a better understanding of whether the population is declining (and how quickly), and cumulative impacts from wind farms that have been constructed, approved and are currently in the pipeline. Regional action should include a regular state census or coordinated count of Brolga. It should also include the regional scaling up of programs to provide habitat improvement for Brolga. Recommendations to this effect have been made by previous wind farm Panels (including, most recently, Dundonnell). The Panel makes further recommendations below which build on those made by previous panels.

4.10 Conclusions and recommendations

Based on the information to hand, the Panel is not satisfied that the exhibited turbine layout satisfies the evaluation objective of avoiding, minimising or offsetting adverse impacts on Brolga. Turbine free buffers based on the BL&A habitat model should, however, enable the evaluation objective to be achieved.

The Panel recommends:

Modify the Project generally in accordance with the plan shown in Document 86, to apply the Brett Lane & Associates habitat model turbine free buffer to each of the 27 Brolga breeding sites identified in and within 3.2 kilometres of the wind farm site.

Require the Proponent to clearly map the full extent of the turbine free buffers, with the final home range polygon boundaries determined in conjunction with Department of Environment, Land, Water and Planning - Environment.

Define the boundary for wetland 25 from the edge of the Plains Grassy Wetland Ecological Vegetation Class as mapped in the vegetation assessment, not the edge of the wetland. The final boundary of the terminal station site should be determined in conjunction with Department of Environment, Land, Water and Planning - Environment.

The Panel's recommendations are reflected in its recommended permit conditions in Appendix F.

The Panel makes the following recommendations for further work:

Department of Environment, Land, Water and Planning - Environment should:

- a) continue to compile the monitoring results of Brolga impacts at all Victorian wind farms, to provide data to:**
 - enable validation of Brolga collision risk modelling
 - clarify the limits and approximations in Brolga collision risk modelling
 - clarify the uncertainties in the predictions
- b) conduct a regular state census or coordinated count of Brolga, to enable a better understanding of overall trends in the Victorian Brolga population and the cumulative impacts on the overall population from wind farms**
- c) coordinate a regional response to Brolga habitat planning, restoration and management to ensure the survival of the species in Victoria, including the coordinated mapping of Brolga turbine free buffer areas**
- d) make the information referred to this Recommendation publicly available.**

5 Other fauna

5.1 Introduction

(i) EES evaluation objective:

The EES scoping requirements set the following evaluation objective:

- *To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.*

(ii) Relevant policies and standards

Clause 52.32

Clause 52.32 of the planning scheme states that an application for a wind farm permit must be accompanied by information regarding flora and fauna listed under the FFG Act and EPBC Act, including significant habitat corridors, movement corridors for protected fauna, and information regarding nearby declared Ramsar wetlands.

The Victorian Wind Farm Guidelines

Section 4.3.4 of the Victorian Wind Farm Guidelines states that where it is reasonably likely that species listed under the FFG Act or the EPBC Act will be present on or near the site, applicants should conduct surveys at the appropriate time for at least 12 months preceding the planning permit application. Survey work should determine the species present, any adverse impacts likely to arise from the proposed wind farm, and any appropriate mitigation measures.

If native vegetation is proposed to be removed, the responsible authority must have regard to *Permitted clearing of native vegetation – Biodiversity assessment guidelines*, (Department of Environment and Primary Industries, September 2013).

(iii) Background

The EES scoping requirements identified following key issues in relation to impacts on fauna:

- loss of, or degradation to, habitat for fauna species listed under the FFG Act and the EPBC Act
- potential collision risk for bird and bat species with project infrastructure
- potential cumulative effects on listed fauna species, in particular Brolga (*Grus rubicunda*), from the Project in combination with other wind farms
- potential indirect habitat loss or degradation resulting from other effects such as surface and groundwater changes, dust and noise.

BL&A prepared a Biodiversity Assessment to support the EES. It is included as Technical Appendix E.

Impacts on Matters of National Environmental Significance (MNES) under the EPBC Act are dealt with further in Chapter 15.

5.2 The Biodiversity Assessment

The assessment describes the Project site as agricultural land which is of low quality for fauna due to its extensive modification and the removal of most habitat elements. Some planted trees, grassland or rocky outcrops, wetlands and creek lines provide moderate to high quality habitat for fauna species.

Based on existing information and field surveys, the assessment found that several listed fauna species are potentially present on the wind farm site. The Assessment's conclusions about impacts on species protected under the FFG Act and the EPBC Act are summarised in Table 6.

Table 6: Impacts of the Project on species listed under the FFG Act and EPBC Act

Species	Listed	Impacts
White-throated Needletail	EPBC Act	The Project site is unlikely to represent important habitat. While the species has been recorded colliding with operating wind farms, the numbers involved are unlikely to represent a significant impact on the population, which numbers in the tens of thousands.
Fork-tailed Swift	EPBC Act	Species is abundant and widespread with population numbers as high as 100,000. Significant impacts on this species from collision with wind turbines are unlikely to occur.
Gull-billed Tern	EPBC Act, FFG Act	Unlikely to occur regularly and in significant numbers due to the limited extent of suitable habitat. Project is unlikely to pose a significant risk.
Latham's Snipe	EPBC Act	Limited extent and quality of wetland habitat and lack of observations make it unlikely that an important population resides on the Project site. The Project is unlikely to have a significant impact.
Plains Wanderer	EPBC Act, FFG Act	Last recorded within ten kilometres of the wind farm in 1992. The species is unlikely to occur regularly at the wind farm site but may occur sporadically. Impacts on this species are considered negligible.
Eastern Bent-wing Bat	FFG Act	Few records from wind farms in western Victoria. Project site is close to the edge of the recorded range. Only one call recorded on the site. Not considered that the species occurs consistently and significant impacts are considered unlikely.
Yellow-bellied Sheath-tail Bat	FFG Act	Wide ranging species which is a rare visitor to Victoria. Recorded eleven times at ground level, not recorded above 45 metres. Victorian population unknown, but likely to be small and unlikely to represent a significant part of the overall, larger, national population. Impact for the population of this species considered negligible.
Striped Legless Lizard	EPBC Act, FFG Act	Established population detected in the south-east of the Project. 45 observations recorded. Impacts on the population predicted to be low as development footprint will be confined to less than 1%

Species	Listed	Impacts
		of the native vegetation on the site. A number of mitigation measures to reduce the impact on this species are proposed. The wind farm boundary was extended to the north-west after the commencement of Striped Legless Lizard survey. The additional area has not been surveyed. However detection of a significant population within the initial study area will be indicative of presence within suitable habitat in the extended area.
Growling Grass Frog	EPBC Act, FFG Act	Recorded from two of the higher quality wetlands in the Project site. Targeted surveys not necessary as the wetlands will not be impacted and no wind farm infrastructure will be located within 100 metres of confirmed Growling Grass Frog wetland sites. Impacts unlikely.
Golden Sun Moth	EPBC Act, FFG Act	Recorded along a road reserve and on private properties. Expected to occur in other areas of suitable habitat including Plains Grassland EVC. 44.10 hectares of Plains Grassland will be removed, but will require a habitat offset. Retention of the remaining habitat (estimated as 4,500 to 6,000 hectares) will ensure the survival of the local and regional population.
Yarra Pygmy Perch	EPBC Act	Historically recorded as present in two waterways that traverse the Project site. Likely to occur. Impacts will not be significant as no project infrastructure other than overhead power lines crosses the two waterways, and turbines are located a minimum of 100 metres from waterways.

Bird utilisation surveys indicated that the most abundant species frequenting the proposed wind farm site were common farmland birds. Surveys recorded:

- eight species of raptors (Australian Hobby, Black Kite, Black-shouldered Kite, Brown Falcon, Brown Goshawk, Little Eagle, Nankeen Kestrel, Wedge-tailed Eagle)
- six species of waterbirds (White-faced Heron, a common farmland bird, seen in the largest numbers).

Of the birds counted, 97.5 per cent flew below the minimum height of the Rotor Swept Area (40 metres). The assessment indicated that the Project is unlikely to have a significant impact on common farmland bird species, or on raptors and waterbirds that utilise the wind farm site in small numbers.

5.3 Evidence and submissions

Submitters argued that the Project site supports a wide diversity of fauna, with a high raptor population including Wedge-tailed Eagles. The results from mortality monitoring from other wind farms indicates that a significant number of raptors and bats are killed by wind farms. Raptor populations are declining. Submitters were concerned that the EES understates the incidence of Wedge-tailed Eagles in the area, and that Wedge-tailed Eagles should be monitored including via carrion monitoring. Submitters called for more robust wildlife assessments including cumulative impact studies by independent experts. BL&A were not regarded as sufficiently independent.

Mr Cumming submitted that mortality monitoring must ensure every turbine is searched, and that the search area is extended to three times the turbine height. He submitted that searches should be done every two weeks for the life of the Project. He and others submitted that the Bat and Avifauna Monitoring Plan (BAM Plan) should be managed by independent scientists, compliance should be independently monitored, and data should be publicly available.

DELWP Environment submitted that uncertainty remains about the bird and bat species that are present in the area and their frequency and utilisation of habitats across the site. It considered that the survey effort (eight sites for birds, five for bats) was limited for such a large site, and that the survey sites were not representative of the whole Project site. It submitted that post construction mortality surveys and targeted bird utilisation surveys are required to better understand the impact on several species vulnerable to turbine collision, and proposed a number of permit conditions for incorporation into a BAM Plan.

Mr Lane responded to DELWP Environment's criticisms about the survey work by stating that the approach taken was comparable to other projects, provided adequate information to characterise bird and bat usage of the site, including threatened species, and that the surveys were consistent with the best practice guidelines of the Clean Energy Council (2013).

In his evidence, Mr Lane acknowledged that Wedge-tailed Eagles and raptors collide with wind turbines disproportionately compared with other bird species. The Panel sought a response from DELWP Environment about what progress had been made in implementing the following recommendation arising from the Stockyard Hill Panel Report, and whether any information relating to cumulative effects had been made public:

Department of Environment, Land, Water and Planning undertake an evaluation program to assess the cumulative effects on raptor populations and other native species that may be vulnerable to wind farm mortality and determine the need for mitigation measures.

DELWP Environment advised that the investigation of post-construction monitoring at Victorian wind farms will result in a report that will provide a discussion of the existing mortality results, as well as recommendations for how mortality monitoring, data collection, and analysis can be improved in the future. The report is expected before the end of September 2018, but the Panel is not aware of the report having been published at the time of writing. DELWP Environment had also considered if the conservation status of Wedge-tail Eagle and Little Eagle is at risk and concluded that the Victorian population of both species do not meet the IUCN criteria for threatened status listing.

5.4 Discussion

Some direct and indirect impacts on fauna are expected. The Panel notes the level of survey effort that has been undertaken to determine bird and bat utilisation across the site. The Panel considers that given the scale of the site, DELWP Environment's concern that these surveys may underestimate post construction interactions with turbines has some validity. While the survey approach may comply with the Clean Energy Council Best Practice Guidelines (2018), these Guidelines are expressed at a framework level and need to be interpreted in the context of an individual wind farm site and its scale.

While the Panel accepts that no evidence has been provided that there is likely to be impacts on listed threatened species (excluding Brolga), a comprehensive bird and bat monitoring plan is required to better understand the bird and bat activity across the site. This can be appropriately addressed in the BAM Plan that the Proponent will be required to prepare under the proposed permit conditions.

The Victorian Wind Farm Guidelines indicate that in addition to listed species, consideration should be given to:

- *the sensitivity of any protected species to disturbance*
- *measures to minimize the impacts on any native species.*

As indicated in submissions, mortality studies from other wind farms show that a number of protected and native species are vulnerable. The Panel agrees with submitters that the impact of wind farms on raptor mortality on regional scale needs to be better understood. Suggestions for more rigorous monitoring standards and reporting protocols, including the introduction of independent monitoring of wind farm mortality studies, has merit. The Panel has included requirements in its recommended permit conditions (Appendix F) that monitoring data be made publicly available.

The Panel notes the DELWP Environment proposal to develop recommendations for future improvements in mortality monitoring and data collection, to inform standard conditions in future BAM plans. The Panel considers that an ongoing focus on developing a better understanding of the cumulative effects on raptor populations and other vulnerable native species must continue to form part of the review by DELWP Environment. The Panel considers it would be appropriate for DELWP Environment to consider the suggestions from submitters to this Panel in finalising its recommendations.

5.5 Conclusions and recommendations

The Panel concludes that impacts on fauna (other than Brolga) can be managed to an acceptable level, subject to implementation of mitigation measures through the development and implementation of a Flora and Fauna Management Plan and a BAM Plan. Subject to the development and implementation of these plans, the EES evaluation objective can be achieved. Suitable permit conditions are included in the Panel's preferred conditions in Appendix F.

Impacts on fauna will be further reduced if the Panel's recommendation to apply BL&A habitat model buffers to protect Brolga is adopted, as up to 47 turbines may need to be removed.

The Panel makes the following recommendation for further work:

Department of Environment, Land, Water and Planning - Environment should:
continue to undertake evaluation of the cumulative effects of wind farms on raptor populations and other native species that may be vulnerable to wind farm mortality, and determine the need for appropriate mitigation measures.

6 Flora and native vegetation

6.1 Introduction

(i) EES evaluation objective

The EES scoping requirements set the following evaluation objective:

- *To avoid, minimise or offset potential adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.*

(ii) Relevant policies and standards

The policies and standards discussed in Chapter 5 are relevant to flora and native vegetation as well as fauna. Other relevant policies and standards include:

- Clause 52.17 (Native Vegetation), which states that applications must comply with the general application requirements and relevant application requirements under the appropriate risk-based pathway.
- Clause 42.01 (Environmental Significance Overlay Schedule 2) and Clause (Vegetation Protection Overlay Schedules 1 and 2), which require a permit for the removal of vegetation. This includes both native and non-native vegetation.

The *Permitted clearing of native vegetation – Biodiversity assessment guidelines*, (Department of Environment and Primary Industries, September 2013) are incorporated into the planning scheme and are used to guide decision making about the biodiversity impacts of removing native vegetation. Methodology to determine strategic biodiversity scores and habitat importance scores for rare or threatened species habitat and the calculation of offset requirements is outlined in these guidelines.

The planning application main report notes that biodiversity impacts and offset requirement (BIOR) reports were obtained from DELWP prior to Amendment VC138, which made changes to Clause 52.17. Clause 52.17-6 includes transitional arrangements that apply to the Project. Accordingly, the requirements of Clause 52.17 prior to Amendment VC138 are relevant for the Project, and the BIOR reports do not need to be updated.

(iii) Background

Components of the wind farm that will have an impact on flora and native vegetation are:

- construction of wind turbines, access tracks, overhead transmission lines and a network of underground cabling
- construction of the temporary quarry
- construction of the over-dimensional transport route.

Impacts include:

- loss and temporary disturbance of native vegetation and associated listed vegetation communities and species listed under the FFG and EPBC Acts
- loss of, or degradation to, habitat for listed flora species.

There is also a risk of a lack of availability of suitable offsets that satisfy the requirements of applicable state government native vegetation policy and the EPBC Act Environmental offsets policy (October 2012).

Impacts on MNES under the EPBC Act are dealt with further in Chapter 15.

6.2 The Biodiversity Assessment

The Biodiversity Assessment prepared by BL&A (Technical Appendix E to the EES main report) includes an assessment of the native vegetation at the wind farm site. It explains that the exhibited development footprint was derived in accordance with the avoid and minimise principles to reduce native vegetation impacts. Through considering alternative turbine configurations, the area of vegetation proposed for removal has been reduced from 102.35 hectares to 49.052 hectares (This figure includes all wetlands mapped on the DELWP Environment wetland layer that were not included in the Biodiversity Assessment).

Native vegetation to be lost includes:

- 6.02 hectares of the FFG Act listed community Western (Basalt) Plains Grassland (WBPG)
- 28.74 hectares of the EPBC Act listed Natural Temperate Grassland Victorian Volcanic Plain (NTGVVP)
- 0.82 hectares of the EPBC Act listed Seasonal Herbaceous Wetlands (freshwater) of the Temperate Lowland Plains (SHWTLP)
- 0.36 hectares of the EPBC Act listed Grassy Eucalypt Woodland of the Victorian volcanic plain (GEVVVP).

Targeted flora surveys were undertaken for 17 listed flora species. Three threatened species were recorded within the investigation area:

- Spiny Rice-flower (FFG Act, EPBC Act)
- Trailing Hop-bush (EPBC Act)
- Small Milkwort (FFG Act).

Vegetation removal associated with the quarry (0.13 hectares) and the over-dimensional transport route (0.54 hectares) are subject to separate planning permit processes.

6.3 Evidence and submissions

Submitters were concerned about the loss of remaining native grasslands, particularly given that so much has already been destroyed. They submitted that native grasslands are a critically endangered ecological community that provides vital wildlife corridors and habitat refuges for many plants and animal species. Submitters were also concerned about impacts on native vegetation in road reserves.

DELWP Environment acknowledged the total loss of native vegetation from the Project, including six EVCs and vegetation communities protected under the FFG Act and the EPBC Act. It concluded that it is satisfied that the Proponent has appropriately applied the avoid, minimise and offset principles as outlined in the *Permitted clearing of native vegetation – Biodiversity assessment guidelines*. DELWP Environment does not object to the grant of a permit for native vegetation removal, subject to certain conditions including an approved offset plan.

DELWP Environment considered that the native vegetation loss does not pose an unacceptable risk or consequence to the state-wide population of Western (Basalt) Plains Grassland. It indicated that the definition of Western (Basalt) Plains Grassland used in the assessment may have underestimated the area of Western (Basalt) Plains Grassland present. While DELWP Environment did not require the assessment to be revised, it would not necessarily agree to the use of this definition in future assessments (Document 101).

DELWP Environment was satisfied with the assessment of threatened flora species, and provided advice on a number of permit conditions that should be adopted to avoid impacts on the three identified species of threatened flora. It did, however, note that targeted flora surveys were not undertaken along the transmission line route. It recommended that pre-construction surveys should be conducted, so that pole locations can be micro-sited to minimise impacts on any threatened flora species. Given the large number of protected flora taxa within the roadsides providing access to the wind farm, DELWP Environment recommended a general Protected Flora Permit be sought under the FFG Act.

6.4 Discussion

The area of native vegetation estimated on the site has been derived by extrapolation rather than direct assessment. This is perhaps not surprising given the size of the site. While the assessment concludes that the area of native vegetation removal represents less than one percent of the native vegetation on the site, this represents approximately 10 per cent of the directly assessed native vegetation (433.8 hectares) and approximately 20 per cent of the area of the development footprint (251 hectares).

Nevertheless, the Panel considers that the Proponent has appropriately applied the avoid and minimise principles in an attempt to reduce native vegetation removal. The assessment indicates that the area of patch vegetation proposed for removal has been reduced from 102.35 hectares for the initial layout to 49.052 hectares (including wetland assessment) in the proposed final layout. Design changes have been described in Appendix 2 of the assessment documenting the 'avoid and minimise' processes that have been undertaken. The Panel is satisfied with this.

The Panel notes the advice of DELWP Environment that impacts on threatened flora species under the FFG Act and EPBC Act can be avoided or managed by the application of appropriate conditions in a Threatened Species Management Plan (or equivalent). As the proposed development is a controlled action under the EPBC Act, mitigation and offsets for the impact on three EPBC Act listed vegetation communities will need to be considered by the Federal Department of Environment and Energy. The Proponent advised that three offset sites have been identified, two within the Project site and another to the north of the Project site, and that the offsets collectively satisfy Victorian and Commonwealth government offset guidance.

Submitters expressed concern about further removal of native grasslands. The Panel notes that all the six EVCs impacted by the Project have a bioregional conservation status of 'endangered'. The Panel acknowledges submitters' concerns, however recognises that the native vegetation assessment has been undertaken in accordance with the government policy on permitted clearing of native vegetation.

There is a considerable difference between the area of Natural Temperate Grassland Victorian Volcanic Plain to be impacted (28.74 hectares) and the area of Western (Basalt) Plains Grassland (6.02 hectares) to be removed. In previous assessments in other panel matters, the assessed area of Western (Basalt) Plains Grassland has been of a similar magnitude to Natural Temperate Grassland Victorian Volcanic Plain when both communities are present. DELWP Environment has indicated the area of Western (Basalt) Plains Grassland may have been underestimated in this case, but has not called for the assessment to be revised. The Panel considers that DELWP Environment should establish a clear basis for future assessments of Western (Basalt) Plains Grassland for native vegetation clearance applications, to avoid this issue arising in future.

6.5 Conclusions and recommendations

The Panel concludes that native vegetation removal for the wind farm should be able to be managed to an acceptable level, subject to the preparation and implementation of a Flora and Fauna Management Plan, a Native Vegetation Management Plan and the provision and management of native vegetation offsets. The Flora and Fauna Management Plan should include a requirement to undertake targeted flora surveys along the transmission line route, so that pole locations can be micro-sited to minimise impacts on any threatened flora species. Subject to implementation of these measures, the EES evaluation objective can be achieved.

The Panel recommends:

Include conditions on the planning permit requiring:

- a) preparation and implementation of a Native Vegetation Management Plan**
- b) the Flora and Fauna Management Plan to a requirement to undertake targeted flora surveys along the transmission line route.**

Suitable conditions are included in the Panel's recommended conditions in Appendix F.

The Panel recommends the following further work:

Department of Environment, Land Water and Planning - Environment should:

- a) publish a standard for the assessment of the Western (Basalt) Plains Grassland Ecological Vegetation Class for native vegetation clearance applications.**

7 Landscape and visual impacts

7.1 Introduction

(i) EES evaluation objective

The EES scoping requirements set the following evaluation objective:

- *To minimise and manage potential adverse effects for the community with regard to landscape and visual amenity.*

(ii) Relevant policies and standards

Clause 12.05-2S

Clause 12.05-2S (Landscapes) of the Planning Policy Framework has the objective of protecting and enhancing significant landscapes and open spaces that contribute to character, identity and sustainable environments.

Farming Zone

The decision guidelines in Clause 35.07-6 of the Farming Zone require the Responsible Authority to consider design and siting issues, including impacts on:

- the natural environment, major roads, vistas and water features and the measures to be undertaken to minimise any adverse impacts
- the character and appearance of the area, features of architectural, historic or scientific significance, or features of natural scenic beauty or importance.

Clause 52.32

The application requirements in Clause 52.32-4 of the planning scheme for a wind energy facility include:

- a site and context analysis which includes:
 - the landscape of the site
 - views to and from the site, including views from existing dwellings and key vantage points such as major roads, walking tracks, tourist routes and regional population growth corridors
 - nearby national parks and Ramsar wetlands and any land listed in the schedule to the clause (in this case, no land is specified in the schedule).
- a design response which includes:
 - accurate visual simulations illustrating the development in the context of the surrounding area and from key public viewpoints
 - a description of how the proposal responds to any significant landscape features for the area identified in the planning scheme
 - an assessment of the visual impact of the proposal on the surrounding landscape and any abutting national park, Ramsar wetland or coastal area.

The decision guidelines in Clause 52.32-5 require the Responsible Authority to consider the impact of the development on significant views, including visual corridors and sightlines.

The Victorian Wind Farm Guidelines

Section 2.1.2 of the Victorian Wind Farm Guidelines states:

The Victorian Government recognises that the Victorian community places a high value on landscapes with significant visual amenity due to their environmental, social and economic benefits ...

To help guide appropriate site selection, design and layout of individual wind turbines, consideration should be given to the significance of the landscape described in relevant planning scheme objectives, including relevant overlays and strategic studies referenced in the planning scheme.

Section 5.1.3 recognises that wind farms will have visual impacts.

A Responsible Authority needs to determine whether or not the visual impact of a wind energy facility in the landscape is acceptable. In doing so, they should consider planning scheme objectives for the landscape, including whether the land is subject to an Environmental Significance Overlay, Vegetation Protection Overlay, Significant Landscape Overlay or a relevant strategic study that is part of the relevant planning scheme.

Section 5.1.3 lists a number of matters that must be taken into account by decision-makers. These are largely reflected in the requirements of Clause 52.32 set out above. Section 5.1.3 also lists a range of mitigation measures to reduce the visual impacts of a wind farm.

The South West Victoria Landscape Assessment Study

Planisphere prepared the *South West Victoria Landscape Assessment Study* (SWVLAS) for the (then) Department of Planning and Community Development in June 2013. The SWVLAS identifies two landscape character types within the viewshed for the Project – Western Volcanic Plain (on which the turbines are located), and Uplands (which includes areas to the north and east of the Project). It describes the landscape character of each of these areas, and their sensitivity to change. The Western Volcanic Plains is described as follows:

The volcanic plain is highly sensitive to change, the flat nature of the plain offers long range views and thus creates a landscape on which there is 'nowhere to hide'. There is limited capacity for this character type to absorb development without becoming prominent in the viewed landscape.

However, balanced against this is the degree to which this landscape has been modified, shaped by man over generations.

The SWVLAS is not a reference document under the planning scheme.

(iii) Background

Wind farms can have significant landscape and visual impacts, primarily through the turbines which are a large element in the landscape. Ancillary infrastructure such as terminal stations and overhead powerlines can also have visual impacts, although these can, to some extent, be ameliorated through landscaping.

The issues are:

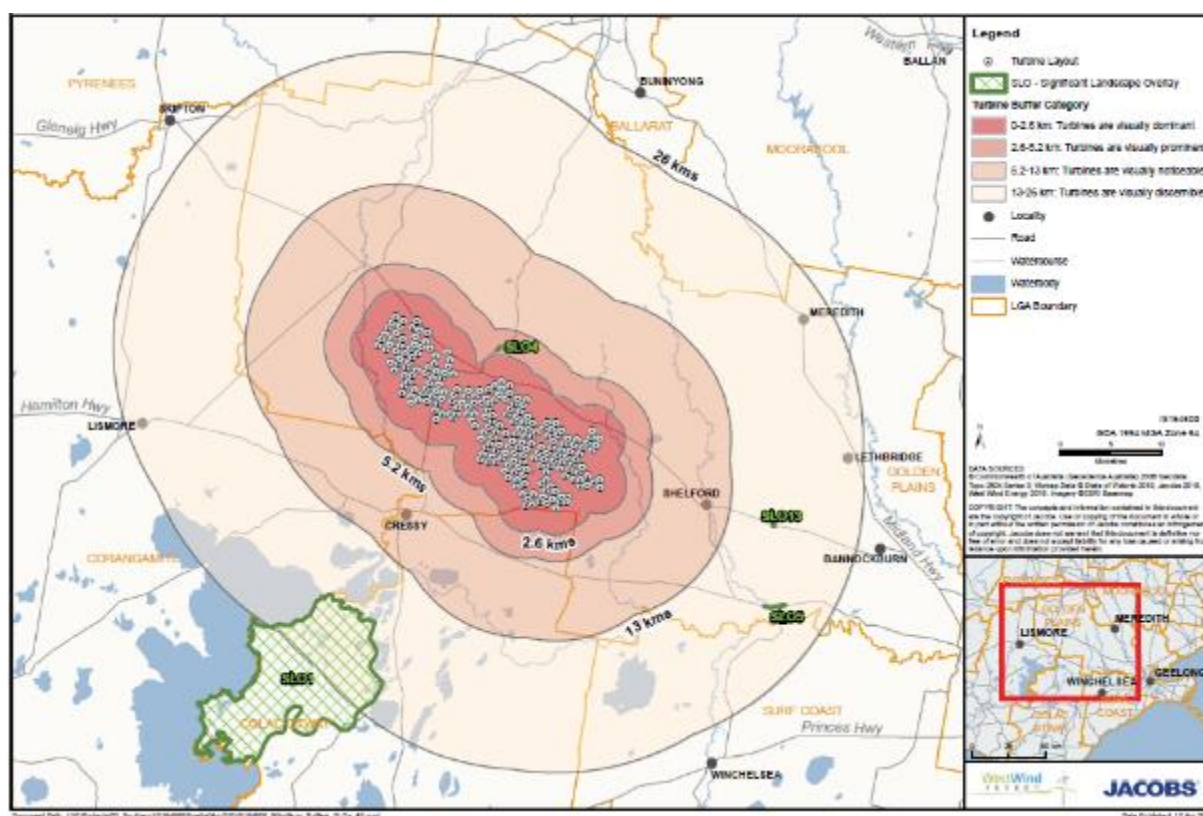
- the accuracy of the photomontages of the turbines
- the assessment of the landscape values and landscape sensitivity of the area
- whether alternative siting and design options should be investigated
- the cumulative impacts of the Project and other approved and operational wind farms in the area.

7.2 The Landscape and Visual Assessment

The *Golden Plains Wind Farm Landscape and Visual Assessment*, April 2018 prepared by Allan Wyatt of XUrban is contained in Technical Appendix L1 of the EES main report.

The Landscape and Visual Assessment documents existing landscape and visual conditions within the viewshed, and identifies potential impacts associated with the construction, operation and decommissioning phases. It includes an assessment of the impacts of the turbines, as well as associated infrastructure including the quarry, the terminal station and collector stations, and the internal powerlines.

Figure 2 Zones of visual influence with SLOs within the 26km viewshed



The Landscape and Visual Assessment defines the viewshed as the area within 26 kilometres from the nearest turbine. This is the distance at which a 230-metre tall wind turbine takes up 0.5 degrees of the vertical field of view. Turbines are still visible beyond 26 kilometres. The viewshed includes the townships of Rokewood, Cressy, Shelford, Lethbridge, Meredith and Lismore.

Within the viewshed are different ‘zones of visual influence’, which are described in Figure 2 as ‘turbine buffer categories’. The impacts of the turbines in the various zones of influence are summarised in Table 7.

Table 7: Visual impact zones of influence

Distance	Turbines are:	Visual impact
13-26 kms	Visually discernible	Turbines are an element in the landscape, discernible in most lighting conditions. At the outer edge of this range, turbines become increasingly imperceptible in all but exceptionally clear lighting conditions.
5.2-13 kms	Visually noticeable	Turbine is visible in the landscape in most lighting conditions. Landscaping between the viewer and the wind turbines can reduce visual impact, more so if vegetation is closer to the viewer.
2.6-5.2 kms	Visually prominent	Turbines have increased visibility and are visually prominent in the landscape.
0-2.6 kms	Visually dominant	Vegetation, to be effective as a screen, must be located immediately adjacent to the viewer.

Source: Panel, based on information in the Landscape and Visual Assessment

The Landscape and Visual Assessment rates the overall visual impacts of the Project according to a ‘scale of effects’ based on four assessment criteria:

- visibility
- distance
- viewer numbers
- landscape character and viewer sensitivity.

The scale of effects is described in Table 8:

Table 8: Scale of effects for visual impacts

Rating	Definition
Nil	No perceptible visual change.
Positive	A visual change that improves the outlook or view.
Negligible	Minute level of effect that is barely discernible over ordinary day-to-day effects. Usually based on distance – ie when visible in good weather, the wind turbines would be a minute element in the view within a man-modified landscape or will be predominantly screened by intervening topography and vegetation.
Low	Noticeable, but will not cause any significant adverse impacts. Applies if any one of four assessment criteria is assessed as low. Examples: <ul style="list-style-type: none"> - a wind farm in a landscape which is man-modified and which already contains many buildings or other vertical elements - the distance from which the wind farm is viewed means that its scale is similar to other elements in the landscape.
Medium	Significant effects that may be able to be mitigated or remedied. Applies if all four assessment criteria are higher than ‘low’.

Rating	Definition
High or unacceptable	Extensive adverse effects that cannot be avoided, remedied or mitigated. Applies if all four assessment criteria are assessed as high. Example: - a highly sensitive landscape, viewed by many people, with the proposed wind farm in close proximity and largely visible.

Source: Panel, based on information in the Landscape and Visual Assessment and Chapter 15 of the EES main report.

The Landscape and Visual Assessment was peer reviewed by Andrew Homewood of Green Bean Design, as required under the Victorian Wind Farm Guidelines. Mr Homewood's peer review is included as Technical Appendix L2 to the EES main report.

7.3 Evidence and submissions

Many submitters raised concerns about the visual impact of the wind farm. They were concerned about the height of the turbines, the size of the rotor diameter, the size of turbines compared to other elements in the landscape (such as the high voltage transmission towers traversing the site), the number of turbines, the proximity of turbines to some residences, and the size of the site. Submitters noted that the proposed turbines are more than double the size of those at the Mt Mercer wind farm, which are clearly visible to residents who live up to 10 kilometres away.

They submitted that the wind farm would constitute by far the most dramatic change to the landscape since European settlement. The turbines would represent a dominant element in the landscape that is completely incongruous with the rural and agricultural character of the area, and would significantly impact on the views from their properties, for themselves and their families, their farm workers (many of whom live on the properties), and guests. Ms Woods said she felt that the Landscape and Visual Assessment assumed that the landscape value of the area was lower because of the high voltage transmission line traversing the site, which many residents had objected to. She felt that it was unfair to use the transmission line as a justification for allowing further visual intrusions into the landscape.

Many of the submitters spend the majority of their days out on their properties, and were concerned that wherever they went on their land, they would be able to see either this wind farm, or others in the area. They felt that this had not been taken into account in the Landscape and Visual Assessment. Ms Wills operates a luxury farm stay accommodation business from her family's property, and was concerned that the cumulative impacts of views of multiple wind farms in the area would detract from the rural character of the area and impact on her business. The Taylors were similarly concerned about cumulative visual impacts on the accommodation on their property, which is used for events such as weddings.

The Waltons submitted that the Project, in particular the arc of turbines surrounding their house and shearers quarters on three sides, would have unacceptable visual impacts. They submitted that the photomontages were unreliable. They did not represent the 'worse case' scenario of the visual impacts of the Project, and had the effect of reducing the apparent scale of the turbines in the landscape. They urged caution in relying on the photomontages.

Council submitted that while the visual impacts of the turbines appear to have been appropriately considered, the visual impacts of transmission line infrastructure did not appear to have been taken into account. It noted that Moyne Shire Council and residents near the Salt Creek Wind Farm have expressed concerns that the poles and wires associated with that project are large, unsightly and particularly reflective. Council attached photographs to its written submission (Document 23) to demonstrate this. Council submitted that there may be the opportunity to include a condition requiring transmission line infrastructure to be non-reflective.

The Proponent submitted that *“judging the acceptability of a landscape or visual impact requires the assessor to confront and overcome, to the extent possible, the challenge of subjectivity”*. The Proponent acknowledged that residents and communities form an attachment to the local landscape, but submitted that planning does not call for a subjective assessment.

The Proponent called Mr Wyatt to give expert evidence at the Hearing. His expert witness statement is Document 31. His evidence was that, while greater impacts will be experienced from some viewpoints, the landscape is capable of accommodating the Project and the overall visual impact of the Project is low.

Mr Wyatt described the landscape as a largely flat agricultural area that was highly modified from its original (pre-European settlement) condition. He noted that the planning scheme give limited significance to the landscapes within the viewshed. Significant Landscape Overlays only apply to limited areas around the edges of the viewshed. He concluded that other than forested hills within the Uplands Landscape Unit, the landscape within the viewshed has low sensitivity to change.

Mr Wyatt disagreed with the SWVLAS’s description of the Volcanic Plains Landscape Unit as being *“highly sensitive”* to change. He regarded it as of low sensitivity, because it is relatively common, has been completely altered since European settlement and regularly undergoes major visual changes. He did, however, acknowledge that some people value the cleared farmland with minimal signs of mechanised construction, and that for these viewers, the turbines could have a visual impact. He also acknowledged that the landscape sensitivity from private (rather than public) viewpoints was invariably higher.

Mr Wyatt prepared a number of photomontages showing views to the site from a range of viewpoints in the public and private realms. His evidence was that he sought to select ‘worst case’ viewpoints, showing the wind farm from vantage points that are most impacted. The viewpoint analyses, and Mr Wyatt’s conclusions, are summarised in Table 9:

Table 9: Wyatt conclusions on visual impacts from various viewpoints

Viewpoints	Description	Impact
VP 1 to VP 22	Public locations within the Volcanic Plains Landscape Unit	Low. Wind turbines will be apparent from the highway, local roads and minor roads. However, this is a broad, expansive landscape with many man-made elements and little topographic variation, and therefore has a low sensitivity.
VP 23 to VP 25	Public locations within the Uplands Landscape Unit	Low to medium. Turbines often screened by vegetation and (further north) topography. Impact is low for views across cleared farmland, because the landscape is of low sensitivity. Vegetated areas have higher sensitivity, but vegetation also screens views. Impacts would be medium if panoramic views were available from unidentified vantage points within forested areas.
Townships	Rokewood, Lismore, Cressy, Shelford, Berrybank	Minimal. Views screened by vegetation, except the recreation areas on the edge of Rokewood (particularly the Rokewood golf course).
Creeks and watercourses	Gnarkeet Creek, Mount Misery Creek, Warrambeen Creek	Negligible. Waterways are relatively small features that are not publicly accessible except from road crossings. Juxtaposition of turbines and creeks do not change the environmental values of the creeks as identified in the planning scheme.
VP A to VP M	Various residences	Ranging from Nil to Medium. Of the 13 viewpoints assessed, 3 assessed as nil/negligible, 4 as low, 4 as low to medium and 2 as medium. Many residences are screened by wind break planting. Others have views, especially residences located in the Uplands Landscape Unit which have a higher impact but mitigated by distance. Landscape mitigation must be balanced against view loss.

Source: Panel, based on information in the Landscape and Visual Assessment.

Mr Wyatt assessed the cumulative impacts of the wind farm together with the three approved wind farms within the viewshed (Mt Mercer, Mt Gellibrand and Berrybank), and others which are outside, but potentially visible from within, the viewshed (Chepstowe, Stockyard Hill, Lal Lal, Yaloak South and Moorabool). His evidence was that cumulative impacts can occur when views of wind farms are:

- sequential (for example, to viewers travelling down roads or highways)
- simultaneous (where multiple wind farms can be viewed from a single viewpoint).

He assessed the cumulative impacts on sequential views from roads and highways as nil to low. Cumulative impacts from simultaneous views were assessed as negligible, on the basis that there are limited viewpoints from which views of different wind farms overlap.

Mr Wyatt assessed the visual impacts of the associated infrastructure. His evidence was:

- The impacts of the quarry are low, capable of being reduced to negligible with additional screen planting. The active face of the quarry will be concealed from public views by the rise in the land on which the quarry will be located, and some screen planting already exists along the northern boundary of the quarry site.
- The terminal station would have a visual impact, but the impact of the buildings could be mitigated with landscaping. He noted that the terminal station includes six additional lattice towers of the same height as the existing 500KV transmission line traversing the site, but the majority of the new powerline infrastructure was less than half this height.
- The overhead powerline infrastructure would, from a distance, appear similar to the ubiquitous 22KV power lines that cross the site. In response to questions from the Panel, he conceded that poles supporting the overhead powerlines would be reflective (if made from galvanised metal), but they would soon become dull with exposure to the elements. He did not consider that undergrounding powerlines would result in significant advantages in terms of reducing the visual impacts of the Project.
- The impacts of aviation lighting (should it be required) are low, but nevertheless it would be preferable from a visual impact perspective for the turbines not to be lit at night. He noted that night lighting serves as a “*constant reminder*” of the presence of the turbines.

Mr Wyatt’s evidence was that the following measures were adequate and appropriate to mitigate landscape and visual impacts:

- offer landscape mitigation to affected landowners
- prepare a landscape plan for the terminal station after final design (given that landscape placement will depend on the final location of underground services)
- landscape around the quarry to reinforce existing planting, establish planting along the road frontage, and rehabilitate faces as quarrying is completed.

7.4 Accuracy of the photomontages

The methodology adopted by Mr Wyatt in preparing the Landscape and Visual Assessment appears to be generally sound. The peer review of the Landscape and Visual Assessment by Mr Homewood concluded that the methodology was consistent with best practice.

Submitters were concerned that the photomontages do not provide an accurate representation of what the wind farm will look like. Of particular concern were the photomontages prepared for VP 3 and VP 21 (both in Wingeel Road), which depict the turbines in the background, with the 500 KV transmission line in the foreground. The turbines look significantly smaller than the transmission lattice towers, despite the lattice towers being less than a third of the height of the turbines.

Mr Wyatt explained that the primary reason for this was perspective. The lattice towers appeared larger because they were significantly closer to the viewpoints than the turbines. The Proponent tabled aerial photographs (Documents 52 and 53) which demonstrated the relative distances of the lattice towers and the turbines from the viewpoints.

The Waltons expressed particular concern that the photomontage for VP J may be misleading. VP J is the viewpoint in the Waltons’ rear yard, behind their house and the shearers quarters

which periodically accommodate farm workers. The closest turbine is located 1,300 metres from the main residence (less from the shearers quarters). Mr Pikusa, for the Waltons, noted that the photomontage did not include the existing anemometer mast. The mast is a similar distance from the viewpoint to several turbines. If it had been included, the photomontages could have been 'ground truthed' by comparing the height of the turbines to the (known) height of the mast. He also noted that the photomontage appears not to include the closest turbine to the house. The Proponent responded that the mast had been installed after the photomontages were prepared.

The Panel questioned Mr Wyatt as to whether he had 'ground truthed' photomontages for other wind farms, by comparing them with the actual views of the wind farm once it is constructed and operating. His evidence was that he had done so on a number of occasions, and that photomontages had proved to be "*extremely accurate*".

While the Panel accepts Mr Wyatt's evidence that photomontages are accurate, photomontages have their limitations. They cannot reflect the visual impact of a number of moving objects in the landscape. They reflect a fixed 60 degree view, rather than representing the actual human experience of being able to scan the view from a single viewpoint. Nor are they able to provide an accurate representation of the experience of a person moving around on a property and looking at the wind farm (and other wind farms) from multiple viewpoints in a day.

While the Panel accepts that Mr Wyatt may have done his best to select 'worst case' viewpoints, he did not manage to do so. There are likely to be viewpoints from which the visual impacts of the wind farm will be significantly greater than as depicted in the photomontages. One obvious example is the Coads' property. The house is in a slightly elevated location, with clear and uninterrupted views across the site toward Mt Mercer Wind Farm. The closest proposed turbines are located just over 1 kilometre from the house, and many turbines are visible within a 60 degree field of view from the house. It is difficult to imagine a greater visual impact than from this location. Yet this location was not assessed.

7.5 Landscape values and landscape sensitivity

Many submitters challenged Mr Wyatt's assessment that the landscape of the Volcanic Plains was of low value and low sensitivity. They challenged the idea that its sensitivity to change is reduced by the modifications to the natural (pre-European settlement) landscape. For example, Mr Taylor questioned the legitimacy of comparing agricultural changes such as shelter belt planting and piles of rocks from cleared paddocks to the impact of introducing 228 turbines 230 metres high into the landscape.

The submitters clearly value the landscape in the area. Many submitters were from families who had been in the area for several generations, with deep connections to the landscape. Neither the Landscape and Visual Assessment nor Mr Wyatt's evidence reflected the subjective value of the landscape to those who live in it.

As unfortunate as this may be, neither the Victorian Wind Farm Guidelines nor Clause 52.32 of the planning scheme call for a subjective assessment of landscape values. They require an objective assessment, based on whether (and how) the value of the landscape is recognised and reflected in the planning scheme. The landscape surrounding the site is not recognised

as having a particular special value in the planning scheme objectives, overlays and strategic studies referenced in the planning scheme. While the Volcanic Plains Landscape Unit is recognised as highly sensitive in the SWVLAS, that document is not referenced in the planning scheme (other than in one Significant Landscape Overlay Schedule).

7.6 Alternative design and siting options

The EES scoping requirements required the Proponent to assess alternative designs to demonstrate how the proposal has been designed to minimise potential environmental impacts. One of the criticisms of the Landscape and Visual Assessment in Mr Homewood's peer review was that it had not presented alternative siting and design options to avoid and minimise visual impacts.

Mr Wyatt's response was that alternative siting options were not necessary or desirable because the visual impacts of the proposal were not sufficient to warrant consideration of alternative siting options. His view was that the visual impacts of the wind farm could be appropriately managed through permit conditions. He also noted in his oral evidence that an irregular grid layout, as is proposed, can reduce the visual impact of a wind farm.

Several submitters put practical siting and design suggestions to the Panel as to how to reduce the visual impacts of the wind farm. For example, Mr Taylor requested a 3 kilometre buffer between turbines and the houses on his property. This would require the removal of two, possibly three turbines. However, while Mr Taylor's suggestion has practical appeal, there is little scope for the Panel to recommend the removal of turbines on landscape or visual impact grounds, given the absence of any specific recognition of landscape values in the planning scheme or the policy framework.

7.7 Cumulative impacts

Several submitters raised concerns about cumulative impacts of multiple wind farms in the area. For example, Naringal Station is in an elevated location and overlooks a large part of the site. Views from the property are extensive in clear conditions, and are likely to be impacted by the Mt Mercer wind farm, the Berrybank wind farm and possibly the Mt Gellibrand wind farm, as well as the Golden Plains wind farm. Mr Taylor's assessment was that up to 50 per cent of the views from Warrambeen would be taken up by wind farms if the Project were to proceed. Submitters also raised concerns that the Landscape and Visual Assessment did not take into consideration how the landowners use their properties, and how these uses would be impacted by the wind farm.

One of the criticisms of the Landscape and Visual Assessment in the peer review was that it did not appear to have fully assessed the cumulative impacts of the wind farm. Ms Woods made the point that none of the photomontages showed the approved but as yet unconstructed Berrybank wind farm. Had the photomontages included Berrybank, cumulative impacts may have been better demonstrated.

Mr Wyatt responded to these criticisms by indicating that he had assessed cumulative impacts on a regional scale, from public viewpoints, by assessing both sequential and simultaneous views of the multiple wind farms in the area. He indicated that while some properties will have views to more than one wind farm, *"it was difficult to find locations on any of the*

properties I visited where a viewer would be able to meaningfully see more than one wind farm from a single viewpoint". He emphasised that the Landscape and Visual Assessment did discuss the added visual impact of multiple wind farms in its analysis of impacts on VP G (1750 Geggies Road), VP K (Warrambeen) and VP J (Wurrook South).

It is clear that several private properties will experience cumulative impacts, albeit perhaps not from the same viewpoints. The families and workers on those farms move around the properties every day. The number of views from their properties that are uninterrupted by wind turbines will be reduced by virtue of the cumulative effect of the Project and other wind farms in the area.

Having said that, past panels, and VCAT, have given greater priority to views from the house, sheds and immediate surrounds, as these are the most frequently used parts of a property. The Panel recognises that assessing the impacts from multiple locations on a property may not be practicable. Further, cumulative impacts for many properties will be ameliorated to some extent by distance, although they cannot be eliminated.

7.8 The Panel's assessment of visual impacts

With the evolution of turbine technology, turbines are becoming bigger and taller. Average turbine heights on approved Victorian wind farms to date are generally between 130 and 160 metres tall. The Project's turbines, at 230 metres, will represent a significant increase in turbine heights compared to other approved and operating wind farms in Victoria. Given the size of the site, and the number and height of the proposed turbines, the Project will be a very dominant element in the landscape. Little can be done to mitigate its landscape and visual impacts.

It is clear to the Panel that several non-stakeholder properties will be significantly impacted by the Project, in particular the Coad property, Wurrook South and Warrambeen. Turbines are proposed within close proximity to the houses on these properties, in some cases little more than a kilometre away. Some properties have little to no screening provided by existing vegetation. The turbines will be highly visible from several locations on these properties, particularly the Coad property. Several properties, including the Coad property, Naringal Station and Warrambeen, will experience cumulative impacts from the Project and other wind farms in the area.

While the Panel accepts that there may not be consistently high viewer numbers on these properties, it does agree with the conclusions in the Landscape and Visual Assessment that impacts on these properties (those that were assessed) will be between 'low' and 'medium'. In particular, impacts on the Coad property and Wurrook South are likely to be at least 'medium', possibly 'high'.

These impacts must, however, be balanced against other important planning and policy considerations. They must also be balanced against the evaluation objective in the EES scoping requirements, to minimise and manage potential adverse effects for the community with regard to landscape and visual amenity.

On balance, the Panel accepts Mr Wyatt's evidence that, on the basis of an objective assessment of the landscape values of the area (as required under the planning scheme and

the Victorian Wind Farm Guidelines), the visual impacts of the wind farm are generally acceptable, and can be managed through permit conditions.

The without prejudice draft permit conditions tabled by DELWP Planning (Document 98) and the Proponent (Document 94) on the last day of the Hearing include conditions that generally accord with those recommended by Mr Wyatt, as well as an additional condition that addresses Council's concerns about the visual impacts of the reflective poles supporting powerlines. These proposed permit conditions also generally accord with the EMMs recommended to address landscape and visual impacts outlined in the Environmental Management Framework.

The Panel agrees with Mr Taylor that there should be some flexibility around the landscape screening offered to affected landowners, and that allowance be made for watering in dry years (which can be a costly and time-consuming undertaking). This is reflected in the Panel's recommended version of the permit conditions in Appendix F.

Some submitters have suggested that the Proponent undertake further assessments of visual impacts of the Project, for example for Warrambeen and the Coad property. Other suggestions include the Proponent giving further consideration to the compensation package offered to affected non-stakeholder properties. While the Panel makes no formal recommendations in this regard, it encourages the Proponent to continue its active engagement with the community, including undertaking further visual impact assessments or photomontages where they are specifically requested by affected landowners, to seek to address landowner concerns as far as reasonably practicable.

7.9 Conclusions and recommendation

On balance, on the basis of an objective assessment of the landscape values of the area, the Panel concludes that the evaluation objective – namely to minimise and manage potential adverse effects for the community with regard to landscape and visual amenity – can be achieved. Nevertheless, the Project will have significant visual impacts that cannot be ameliorated. These impacts will be significantly reduced if the Panel's recommendation to apply BL&A habitat model buffers is adopted, as up to 47 turbines may need to be removed.

Specifically, the Panel concludes:

- The wind farm will be a visually dominant element in the landscape, visible for many kilometres. It will have visual impacts which cannot be eliminated. Impacts on some landowners will be significant. The wind farm will also contribute to cumulative visual impacts of the multiple wind farms in the area.
- It is likely that the photomontages in the Landscape and Visual Assessment do not assess the 'worst case' visual impacts from the wind farm. The absence of any assessment of visual impacts on the Coad property is notable.
- However, there is limited recognition and protection of the landscape values of the area in the planning scheme. Assessed against this policy context, the landscape and visual impacts are acceptable.
- The proposed permit conditions tabled on the final day of the Hearing are generally appropriate, subject to modifications to reflect Mr Taylor's suggestions that there be some flexibility in the landscape mitigation offered to affected landowners, and that allowance be made for the establishment and watering of landscape mitigation.

The Panel recommends:

Include conditions on the planning permit requiring landscaping mitigation offered to affected landowners to be tailored to the relevant property, and to require the Proponent to meet the costs of watering and maintaining landscaping mitigation during its establishment.

Suitable conditions are included in the Panel's recommended conditions in Appendix F.

8 Noise and vibration

8.1 Introduction

(i) EES evaluation objectives

The EES scoping requirements sets the following evaluation objective:

- *To manage potential adverse effects for the community, businesses and land uses with regard to construction noise, vibration, dust, traffic and transport and operational turbine noise, electromagnetic interference and aviation safety.*

(ii) Relevant policies and standards

Clause 52.32

Clause 52.32 of the planning scheme specifies that operational noise associated with new wind farms must be assessed and comply with New Zealand Standard *NZS6808:2010 Acoustics–Wind farm noise* (the New Zealand Standard) throughout the life of the project. Clause 52.32-4 specifically requires the design response to include an assessment of whether a high amenity noise limit is applicable, as assessed under Section 5.3 of the Standard.

The New Zealand Standard

The New Zealand Standard states that wind farms must comply with the following noise limits:

- general limit – 40 dB L_{A90} , or the background sound level plus 5 dB, whichever is the greater
- high amenity limit – 35 dB L_{A90} , or the background sound level plus 5 dB, whichever is the greater.

The general limit applies at all times and in all conditions. The high amenity limit applies up to a maximum wind speed threshold.

The limits in the New Zealand Standard are intended to provide reasonable protection against loss of amenity or sleep disturbance in a dwelling. The Standard is based on the World Health Organisation *Guidelines for Community Noise* assumption of a 15 dB reduction from outside to inside a house with the windows partially open for ventilation. Therefore, an outdoor noise level of 45 dB equates to an indoor level of 30 dB. This approach is consistent with the current industry practice of using the recommendations outlined in the final report by the European Working Group on Noise from Wind Turbines (ETSU-R-97) that both day and night time lower fixed outdoor limits can be increased to 45 dB.

Other relevant policies and standards

Other relevant policies and standards include:

- Construction noise must comply with *EPA Publication 1254 Noise Control Guidelines*, October 2008, supplemented by relevant guidance.
- Construction noise relating to the temporary quarry must comply with *EPA Publication 1411 Noise from Industry in Regional Victoria*, October 2011 (NIRV) and *Environmental guidelines – Ground Vibration and Airblast Limits for Blasting in Mines and Quarries* published on the Victorian Earth Resources website on 15 July 2015.

- Operational noise associated with ancillary infrastructure must comply with NIRV.
- In the absence of a Victorian policy or standard in relation to:
 - construction traffic noise levels on public roads, the Proponent assessed the Project in accordance with British Standard BS 5228-1:2009
 - construction vibration levels, the Proponent assessed the Project in accordance with the NSW Roads and Maritime Service's publication *Construction Noise and Vibration Guideline*, August 2016.

(iii) Background

The Project will generate noise and vibration at different times. Noise and vibration sources include construction activities, temporary quarrying, collector stations, terminal station and turbine operation.

Noise and vibration impacts are addressed in Chapter 17 of the main EES report, and in Appendix N1 (Marshall Day Acoustic, Environmental Noise and Vibration Assessment) and Appendix N2 (Resonate, Peer Review of Environmental Noise and Vibration Assessment).

Chapter 23 of the EES main report sets out a number of EMMs to manage construction noise and vibration impacts, and operational noise impacts. They include:

- Undertake a pre-development noise assessment in accordance with the New Zealand Standard.
- Prepare and implement a Construction Noise and Vibration Management Plan.
- Design and operate all temporary concrete batching plants in accordance with *EPA Publication 628: Environmental Guidelines for the Concrete Batching Industry*.
- Prepare and implement a Blasting Plan if any blasting is required.
- Carry out quarry operations in accordance with Work Authority WA006594, including the requirement for an approved quarry Work Plan that documents measures to achieve NIRV compliance, including working hours, equipment noise controls and perimeter screening.
- Prepare and implement an Operational Noise Management Plan, including compliance testing.
- Prepare and implement a Complaint Investigation and Response Plan that describes how complaints are recorded, managed and evaluated in order to determine whether compliance investigation studies are required.

Issues in dispute related to operational noise from the wind farm. Issues related to:

- noise modelling uncertainty
- the adequacy of background noise monitoring undertaken to date
- whether (and where) a high amenity limit applies
- whether there should be a penalty applied for special audible characteristics.

Construction and decommissioning noise were not disputed, but have nevertheless been addressed by the Panel below.

8.2 The Noise and Vibration Assessment

The Noise and Vibration Assessment identified a total of 220 buildings within 3 kilometres of the proposed turbines (refer to Figure 3):

- 137 non-stakeholder receivers, including 135 dwellings on properties that are not associated with the Project (referred to as ‘neighbour dwellings’), one school and one child care facility
- 45 dwellings on stakeholder properties that are associated with the Project, referred to by the Proponent as ‘host dwellings’
- 38 other buildings (sheds, community halls, businesses and the like) which are not considered as noise sensitive locations under the New Zealand Standard.

Figure 3 Location of buildings within 3 km of turbines



(i) Construction noise

The Noise and Vibration Assessment concluded that:

- Noise generated by construction can be acceptably managed in accordance with *EPA Publication 1254: Noise Control Guidelines*, using a combination of restricted working hours and good practice working measures.
- There may be unavoidable work that will need to be carried out at night, such as turbine erection (which must be done in low wind speeds), large concrete pours and delivery of over-dimensional loads. However, this should be minimal.
- Noise generated by the temporary quarry can be acceptably managed to meet NIRV by restricting operations to day time hours and, where necessary, establishing suitable noise agreements with the owners of neighbouring stakeholder properties.
- Decommissioning noise can be managed using similar measures to those implemented for the construction phase.

(ii) Operational noise

The Noise and Vibration Assessment found that predicted operational noise levels will comply with the applicable noise limits outlined in the New Zealand Standard. Specifically:

- predicted noise levels at all non-stakeholder sensitive receivers are 39 dB L_{A90} or lower, which is lower than the general noise limit of 40 dB L_{A90}
- predicted noise levels at most stakeholder residences are 45 dB L_{A90} or lower
- up to four stakeholder receivers have predicted noise levels exceeding 45 dB L_{A90} , depending on the turbine model and hub height considered
- the highest predicted noise level at any stakeholder residence is 47 dB L_{A90} .

(iii) Peer review

The peer review generally corroborated the findings of the Noise and Vibration Assessment. It concluded that:

- *The adopted sound power levels for the candidate turbines are considered typical of turbines with a rated power output of 3 to 5 MW and include a 1 dB uncertainty factor.*
- *The prediction methodology described is consistent with the findings of a previous study conducted of operating sites in Australia.*
- *The predictions presented in the Noise and Vibration Assessment Report demonstrates that:*
 - *predicted noise levels at all non-involved sensitive receivers are 39 dB(A) or lower, which is lower than the base noise limit of 40 dB(A)*
 - *predicted noise levels at most involved residences are 45 dB(A) or lower, with up to four stakeholder receivers having predicted noise levels exceeding the 45 dB(A) reference level depending on the [turbine] model and hub height considered. The highest predicted noise level at any stakeholder residence is 47 dB(A).*

The Peer Review (and Mr Evans' expert witness statement) concluded:

The predictions are considered accurate based on the documented inputs and the assessment appropriate and in accordance with the New Zealand Standard and the Victorian Wind Energy Guidelines ...

We consider that the Noise and Vibration Assessment Report prepared for the Project identifies appropriate noise and vibration assessment criteria and demonstrates that the Project is expected to be able to operate in compliance with these criteria, subject to the incorporation of appropriate noise and vibration management measures during construction and operation.

EPA did not contest the Noise and Vibration Assessment and peer review and had "no objection to the EES or planning permit application as proposed".

8.3 The New Zealand Standard

The New Zealand Standard is the appropriate standard for noise emissions from wind farms. It is specifically referenced in Clause 52.32 of the planning scheme and the Victorian Wind Farm Guidelines.

The Panel notes that the New Zealand Standard does not have the objective of providing absolute protection. It does not require no audible wind turbine noise, or that the potential for sleep disturbance is completely mitigated. The proposition of inaudibility and no adverse noise effects is not practical. There are no sound sources for which such a criterion is adopted in Australia, and there is no evidence to suggest sound from wind farms should be treated differently. It would be contrary to accepted impact assessment, and regulatory and policy approaches, to impose an absolute criterion of inaudibility.

8.4 Noise modelling uncertainty

(i) Evidence and submissions

Several submitters, including Mr Pikusa for the Waltons, submitted that there is much uncertainty in the noise modelling. Mr Pikusa urged the Panel to be cautious about relying on the modelling to form a conclusion that the wind farm will be able to comply with the noise limits. He also expressed concern that much of the noise assessment process, including the final noise assessment (to be based on final turbine selection and layout) is proposed to be done after the permit has issued, and approved by way of a secondary consent process that does not allow public participation.

Mr Evans' evidence was that the input assumptions and model prediction algorithm required to be used under the New Zealand Standard (which must comply with ISO 9613-2:1996) together result in higher predicted noise levels than would occur for the vast majority of conditions. This included the assumption in the model that all receptors are downwind of the turbines at all times, when in reality many receptors will be in upwind or crosswind conditions. His evidence was that the modelling therefore resulted in an appropriately conservative assessment of the predicted noise emissions from the wind farm.

On the other hand, Dr Thorne (who gave evidence for the Waltons) argued that the prediction tables in the EES and Noise and Vibration Assessment did not adequately reflect the potential uncertainty in the modelling, and the results should have been expressed as +/- 3 dB at 1,000 metres from the turbines.

The Noise and Vibration Assessment is based on two indicative turbines. Submitters expressed concerns that the initial instructions to Marshall Day indicated that there were three indicative turbines under consideration, and yet only two were used in the modelling. Submitters also expressed concerns that the noisiest candidate turbine may not have been selected for the modelling, and that the turbine sound power output assumptions used in the modelling may not have been suitably accurate or conservative.

Mr Delaire responded that turbine sound power levels are tested and rated in accordance with International Electrotechnical Commission publication *IEC 61400-11:2012 Wind turbines – Acoustic noise measurement techniques*, consistent with the recommendations of the New Zealand Standard. IEC 61400-11:2012 adds 1 dB to measured sound power outputs, to account for uncertainty. Mr Delaire and Mr Evans agreed that the addition of 1 dB to turbine sound power levels is reasonable and accounts for typical test uncertainty. They also agreed that the use of L_{eq} data rather than L_{A90} levels in sound power outputs effectively adds approximately 2 dB to the predicted noise levels.

Relying on the evidence of Mr Delaire and Mr Evans, the Proponent submitted that the noise modelling was conservative, and that 2-3 dB had effectively already been added to the noise predictions. Expressing the results as +/- 3 dB as Dr Thorne suggested would not be appropriate.

To give confidence in the sound power levels of the turbines, the Proponent proposed near field testing be conducted once the wind farm was constructed, to verify sound power and tonality (that is, special audible characteristics), and to confirm noise emissions of the installed turbines are consistent with the findings presented in the Noise and Vibration Assessment. The proposed permit conditions tabled on the final day of the Hearing included draft conditions for near field testing.

(ii) Discussion

Operational wind farm noise has been a contentious matter for projects in Victoria, particularly for non-stakeholder dwellings who may be affected, but do not receive financial compensation in the form of turbine lease payments.

The main source of operational noise is the wind turbines. Operational noise is dominated by aerodynamic noise produced by the rotation of the blades. Mechanical components such as gearboxes within the turbine's nacelle can also be a source of noise. Ancillary infrastructure can also generate some operational noise, including the power transformers and, to a lesser extent, new overhead powerlines.

Predictive noise modelling is undertaken as part of the wind farm approval process, to predict whether operational noise from the wind farm will be capable of complying with the applicable limits in the New Zealand Standard. Predictive noise modelling is a technically complex issue, and any predicative noise assessment will involve some degree of uncertainty. The key questions for the Panel are:

- Has the Noise and Vibration Assessment been undertaken in accordance with the New Zealand Standard?
- Can the Panel have confidence in the predictions of the noise modelling, and ultimately whether the wind farm is likely to comply once operational, notwithstanding the inherent uncertainty in the noise modelling?

The Panel is not persuaded by claims that the noise modelling may have (intentionally or unintentionally) underestimated the predicted noise emissions from the wind farm.

First, the New Zealand Standard recommends the use of a model prediction algorithm that meets the requirements of ISO 9613-2:1996. These prediction methods have been in use for wind farms in Australia and internationally for over a decade. There was no dispute among the experts that the use of modelling algorithms that comply with ISO 9613-2:1996 is appropriate.

Second, predicative noise modelling has been shown to be accurate. In Victoria and elsewhere, wind farm operators must undertake noise compliance testing once the wind farm is operational. This allows noise predictions to be validated. The New Zealand Standard Technical Committee has stated that "*in practice the method [ISO 9613-2:1996] has been shown to be accurate*" (Dr Stephen Chiles, 2010, Vol.23/2, New Zealand Acoustics, at pages 20-22). None of the submissions or evidence brought any cases to the attention of the Panel

where significant errors have been found. While Dr Thorne claimed that in his experience *“modelled sound level predictions are generally not accurate”*, he did not provide the Panel with any specific examples supporting this claim. Instead, he broadly reasoned that prediction tables should have stated the estimated accuracy as +/- 3 dB.

Third, the Proponent, its consultant and the turbine manufacturer all have an interest in ensuring accurate wind farm noise predications. If noise predictions are not accurate, this could significantly impact the viability of a project, cause major disputes and delays and expose the parties to significant compliance risk.

Regarding the use of candidate turbines in the noise modelling, it is normal in wind farm projects for a proponent to nominate indicative candidate turbines for the purposes of noise modelling. The reason is that during the (often several) years between project approval and commitment to proceed, there can be changes in turbine types available on the market.

The Panel is comfortable with basing the Noise and Vibration Assessment on two indicative turbines. Once a final turbine model is selected, near field testing and a further pre-construction noise assessment must be undertaken using the acoustic characteristics of that chosen model to establish compliance with the New Zealand Standard.

Regarding Mr Pikusa’s point about secondary consent processes, it is not possible to entirely avoid secondary consents under a wind farm permit. However, the Panel is satisfied that if, in the assessment of noise impact of the final turbine model, there is a discrepancy in the results compared to the indicative model used, then the process would be satisfactory to ensure that the discrepancy is resolved. Post-operational testing will further confirm whether the wind farm is operating within the noise limits.

Having considered all the submissions and evidence, the Panel is satisfied that the Noise and Vibration Assessment, including the predictive noise modelling, has been undertaken in accordance with the New Zealand Standard. It is satisfied that the Assessment has an appropriate level of inbuilt conservatism, and that a 2 – 3 dB margin of error is effectively built into the results. The Panel therefore has confidence that the Noise and Vibration Assessment provides a suitable level of certainty that the wind farm will be capable of complying with the applicable noise limits.

Irrespective of the uncertainty in the noise modelling, the draft permit conditions provide a robust framework to ensure compliance with the applicable noise limits at all times. The conditions include a requirement for near field testing, which will allow the sound power levels of the final turbines to be validated and corrected (if required) in the pre-construction noise assessment. The proposed permit conditions include a robust program of post-construction compliance monitoring that will enable compliance to be tested and verified, provided suitable background noise monitoring data is available.

(iii) Findings

The Panel finds:

- The Noise and Vibration Assessment, including the predictive noise modelling, has been undertaken in accordance with the New Zealand Standard and represents a reliable prediction of noise levels.

8.5 Background noise monitoring

(i) Introduction

Section 7.2.1 of the New Zealand Standard requires that background noise measurements be made in a representative range of wind speeds and directions generally expected at the wind farm. The Standard states that notionally, 1,440 data points are regarded as sufficient to accurately establish the background noise levels in a representative range of wind speeds and directions. The Standard recommends further measurements if the results show:

- the lack of uniformity in the distribution of data points
- a lack, or sparseness, of data points for one or more wind conditions
- significant variation in background noise levels due to seasonal factors (such as insects and livestock).

(ii) Evidence and submissions

According to the EES, background monitoring was typically conducted over three weeks. Dr Thorne's evidence was that background monitoring for a wind farm should be undertaken over at least six months, and preferably 12 months (which equates to 52,560 data points). He cited the three factors described in Section 7.2.1 of the New Zealand Standard as justification (namely the lack of uniformity in the distribution of data points, a lack of data points for one or more wind conditions, and significant variation in background noise levels due to seasonal factors).

According to Mr Evans' evidence, at six of the 15 monitoring locations, the total number of valid data points analysed was less than the 1,440 minimum specified by the Standard. This was generally due to a lack of availability of wind data. Less than 2,000 valid data points were obtained for all but three of the monitoring locations. Mr Evans indicated that a background noise dataset with less than 2,000 valid data points may indicate a lack of data for particular wind directions.

(iii) Discussion

Establishing accurate background noise levels is critical. Accurate background levels are needed for two reasons – to establish the applicable noise limits that the wind farm will be required to meet, and to enable future compliance to be properly assessed and verified.

The approach is to establish the background noise levels at various locations in the absence of the wind farm, use these levels as the basis for a specified noise increment, and hence determine the 'acceptable noise limit'. This limit then defines the maximum level for the initial assessment of expected noise. Vitality, it is the noise limit that must be shown to be met for post-construction monitoring and hence demonstration of compliance.

Background noise monitoring is the third step in the assessment process described in Figure 1 of the New Zealand Standard. Section 7.1.4 requires background noise monitoring at all noise sensitive locations between the predicted 35 dB L_{A90} and 40 dB L_{A90} noise contours. For the Project, this includes 89 'non-stakeholder' receivers (as set out in Table 17 of the Noise and Vibration Assessment).

Section 7.1.5 of the New Zealand Standard allows monitoring at one location for a group of sensitive receivers, provided the selected location is representative and similar in proximity and character to other noise sensitive locations in the group. Marshall Day recommended background noise monitoring at 23 representative locations. Access was not available to eight of the 23 properties, hence only 15 locations were monitored.

The Panel had some concerns with the adequacy of the background noise monitoring, including whether sufficient representative locations were monitored (noting that there was a lack of locations to the north of the Project site), and whether sufficient valid data points had been collected to provide a robust and accurate picture of the background noise levels in the area. Neither the Noise and Vibration Assessment nor the EES explained in any detail how the 15 sites were representative of all potential noise sensitive receivers, or why there was a limited number of non-stakeholder monitoring locations to the north of the Project site.

The Panel agrees with Mr Evans and Dr Thorne that 1,440 points is not adequate to provide a robust and accurate picture of the background noise levels. The question is, where is the appropriate balance struck between the 10 days (1,440 points) monitored by Marshall Day, and the 12 months (52,560 points) recommended by Dr Thorne?

This question was considered in some detail in the panel reports for the Stockyard Hill Wind Farm (August 2010 and May 2017), which recommended:

- Background noise data and post construction noise monitoring data should be analysed against wind direction at the nearest available anemometer.
- A minimum of 4,000 valid data points must be collected for each site.
- Data must be analysed by 24 hour and night (10 pm to 7 am) only periods, and for each time sector data is to be analysed for wind directions of $\pm 45^\circ$ of 0° , 90° , 180° and 270° .

The aim is to collect enough data from all eight wind rose directions, and to ensure that the noise data is collected with wind speed and direction data. This is because if an area experiences a very strong predominance of wind from one direction, and the sampling period is short, there could be little or no data available for some wind directions.

In response to questions from the Panel, Mr Delaire conceded that the background noise monitoring undertaken to date was probably not sufficiently robust to provide an accurate picture of the background noise levels at and around the site, and conceded that more background noise monitoring would need to be done before the wind farm becomes operational. He indicated that it was preferable to undertake that monitoring closer to the time the wind farm will be constructed, as background noise conditions may change between now and then. His view was that background data collected closer to the point in time at which the wind farm will start operating will provide a better baseline against which to assess future compliance with noise limits of background + 5 dB, as set out in the New Zealand Standard.

While the Proponent and the three acoustic experts might all agree that further background noise monitoring will be required prior to construction, the Panel considers that the public EES and planning process could have been better served by more comprehensive and robust background noise monitoring. This would have provided a clear and transparent indication (through the EES process) to non-stakeholder receivers as to what the current background

noise level is, and what noise limit the Project will be required to achieve at their home (that is, 40 dB or background + 5 dB).

That said, the Panel accepts that reliable and robust background monitoring may not be necessary for predictive modelling purposes. It will, however, be required:

- prior to construction of the wind farm, to:
 - determine the applicable limits for operational noise
 - enable the pre-construction noise assessment to be completed, to check that the wind farm will be able to comply with the applicable limits
- once the wind farm is operating, to enable the post-construction acoustic compliance reports to be completed, to check that the wind farm is in fact complying with the applicable limits.

In the absence of more information that might assist the Panel, a minimum 28-day program (which would equate to 4,032 valid points) would seem a reasonable approach, and one that is consistent with previous panels (Stockyard Hill). The Panel recognises that this is more than the 1,440 data points required under the Standard, and more than the 2,000 data points Mr Evans suggested as a minimum requirement. At the end of the day the Panel considers a 'beyond compliance' approach to collecting robust and comprehensive background monitoring can only serve the Proponent, community and decision makers during operation and when dealing with compliance and complaint issues.

(iv) Findings

The Panel finds:

- The background monitoring undertaken to date does not fully meet the requirements of the New Zealand Standard.
- This has led to uncertainty in the characterisation of the background noise, and uncertainty as to the noise limits that the Project will need to meet.
- Further background noise monitoring should include a minimum of 4,032 valid data points collected for each site, analysed by 24 hour and night (10 pm to 7 am) only periods, and for each time sector analysed for each 45 degree wind rose direction.

8.6 High amenity area limits

(i) Introduction

Section 5.3.1 of the New Zealand Standard states:

The wind farm noise limit of 40dB LA₉₀ in 5.2 is appropriate for protection of sleep, health and amenity of residents at most noise sensitive locations. In special circumstances at some noise sensitive locations a more stringent noise limit may be justified to afford a greater degree of protection of amenity during evening and night time. A high amenity noise limit should be considered where a plan promotes a higher degree of protection of amenity related to the sound environment of a particular area, for example where evening and night-time noise limits in the plan for general sound sources are more stringent than 40 dB LA_{Aeq} or 40 dBA L₁₀. A high amenity noise limit should not be applied in any

location where background sound levels, assessed in accordance with section 7, are already affected by other specific sources, such as road traffic sound.

The high amenity limit specifies sound levels during evening and night-time periods that do not exceed 35 dB L_{A90} or background sound level + 5 dB, whichever is the greater. The high amenity noise limit only applies to wind speeds with low background sound levels. The New Zealand Standard suggests wind speeds up to 6 m/s, subject to site based assessment.

The Victoria Civil and Administrative Tribunal (VCAT) considered the applicability of high amenity limits in the context of the Victorian planning framework in *Cherry Tree Wind Farm Pty Ltd v Mitchell Shire Council & Ors* (Includes Summary) (Red Dot) [2013] VCAT 521 (*Cherry Tree*). VCAT found that the Farming Zone does not expressly or by implication promote a higher degree of protection of amenity related to the sound environment. Nor does it require that a particularly quiet environment be preserved. It found that a high amenity limit therefore should not apply in the Farming Zone.

VCAT found at paragraphs 107 to 111 that:

The ‘plan’ referred to in section 5.3 of the NZS 6080:2010 is a plan as defined by the Resources Management Act 1991 of New Zealand and that section 43AA of that Act defines ‘plan’ to mean ‘a regional plan or a district plan’. No such animals exist under the Victorian legislation.

Applying the standard mutatis mutandis to the Victorian experience we treat the plan referred to in the standard as a planning scheme approved under the Planning and Environment Act 1987. The Mitchell Planning Scheme does not anywhere expressly or by implication “promote a higher degree of protection of amenity related to the sound environment of a particular area”. Approaching the matter by a process of elimination it can be seen with certainty that the controls contained within the Farming Zone, which includes most of the locality, do not answer this description. The purpose of the Farming Zone is to encourage agricultural use, which is not an inherently quiet land use. In fact reference to the zone purposes confirms that agricultural use is to be preferred to residential use if there is potential conflict between the two.

Accordingly, the Tribunal concludes that the subject land and its locality is not capable of designation as a high amenity area because it does not possess the necessary characteristics of such an area as specified in the NZ standard.

Ultimately the debate is largely sterile. This is because the modelling carried out by Mr Turnbull of Sonus, the expert acoustician who gave evidence on behalf of the permit applicant, demonstrated that all residential properties from which consent has not been obtained lie outside the 35dB(A) noise contours when the wind farm wind speed is 6m/sec or lower, including the Wollert Glen and Waugh houses which are in the course of construction.

This means that the NZ standard is not only met but is comfortably exceeded. In fact the modelling indicates that the lower noise limit applicable in a high amenity area will be achieved.

Since the *Cherry Tree* decision, planning panels have not accepted arguments to apply high amenity limits in the Farming Zone.

Novel arguments were put to this Panel about when a high amenity limit may still apply notwithstanding that the land in question is located in the Farming Zone.

Further, the Project is located close to the township of Rokewood. The township itself is in the Township Zone, while the surrounds are in the Low Density Residential Zone (LDRZ). The entire town, including 52 dwellings, a school and child care centre, are located within the 35 to 40 dB predicted noise contour, as shown in Figure 4.

Figure 4 Wind farm noise contours in relation to Rokewood Township



(ii) High amenity limit in the Farming Zone

Evidence and submissions

The Waltons' property is located in the Farming Zone. Mr Pikusa sought to distinguish *Cherry Tree* on the basis that, unlike in *Cherry Tree*, the dwellings on the Waltons' property are within the 35 dB noise contour. He referred to the following paragraphs in the decision:

Ultimately the debate is largely sterile. This is because the modelling carried out by Mr Turnbull of Sonus ... demonstrated that all residential properties from which consent has not been obtained lie outside the 35dB(A) noise contours when the wind farm wind speed is 6m/sec or lower, including the Wollert Glen and Waugh houses which are in the course of construction.

This means that the NZ standard is not only met but is comfortably exceeded. In fact the modelling indicates that the lower noise limit applicable in a high amenity area will be achieved.

He submitted that as the predicted noise levels at the Walton residences exceed 35 dB, the debate is not sterile – it is live.

Mr Pikusa submitted that even if the planning scheme does not promote a higher degree of protection of amenity related to the sound environment, clause C5.3.1 of the Standard provides an alternative method to determine whether high amenity limits are applicable. Section 5.3.1 is followed by a grey ‘commentary’ box which states:

C5.3.1 The following steps provide guidance on whether a high amenity noise limit maybe be justified:

- a) There is no need to consider noise sensitive locations outside the predicted 35 dB L_{A90} windfarm sound level contour.*
- b) Using predicted wind farm sound levels and measured background sound levels relating to any particular noise sensitive location under investigation, calculate for each 10-minute time interval in the evening or night-time prescribed time frames the arithmetic difference between the estimated post-installations sound level and the background sound level for a range of wind conditions representative of long-term wind sampling at the wind farm.*
- c) The differences calculated in (b) for all 10-minute time intervals in the prescribed timeframe should be arithmetically averaged (there should typically be in excess of 540 data points at night – see C7.2.1).*
- d) If the average difference in an evening or night-time prescribed time frame is less than 8 dB then a high amenity noise limit is unlikely to be justified.*
- e) If the average difference in an evening or night-time prescribed time frame is greater than 8 dB then a high amenity noise limit is likely to be justified.*

He submitted that based on C5.3.1, the New Zealand Standard should be interpreted as saying that a high amenity limit can be justified if the wind farm noise levels exceed night time background levels by more than 8 dB – even if the planning scheme does not afford a higher degree of protection of the sound environment.

Relying on Dr Thorne’s evidence, he submitted that the noise modelling shows that turbine noise at his clients’ dwellings would be an average of 37 dB at 8 m/s. The night time background level monitored at the nearest monitoring station is 25 dB, a difference of 12 dB. On this basis he argued that C5.3.1(e) is triggered, and a high amenity noise limit is justified.

Discussion

The first thing to note about Mr Pikusa’s argument about the application of a high amenity limit at the Walton’s property (in the Farming Zone) is that Section C5.3.1 of the New Zealand Standard is provided for guidance, more so the “C”5.3.1 denotes commentary. While this section is not to be ignored, the Panel places greater weight on the main text in Section 5.3.

The Panel takes a different approach to the interpretation of the New Zealand Standard than Mr Pikusa. In the Panel’s view, Section 5.3 of the Standard, read in its entirety, requires a two step approach. Step one is to determine whether the area in question is a high amenity area – in other words, an area that the planning scheme affords a higher level of protection of the

sound environment. If (and only if) the area is a high amenity area, then Step 2 is to apply the analysis outlined in C5.3.1 to determine whether a high amenity limit should apply or not. In this regard the site must also be within the 35 dB contour (C5.3.1(a)) and the night time background sound must be significantly lower than predicated noise levels (C5.3.1(e)).

In this case, the Panel does not consider that the Waltons' property is in a high amenity area. The property is located in the Farming Zone, and in the Panel's view, *Cherry Tree* definitively determines that land in the Farming Zone is not a high amenity area. Therefore, the analysis required under C5.3.1 is not relevant.

In any event, the Panel notes that section 5.3.3 also states that "*wind farm noise limits should not be set lower than 35 dB L_{A90} at any time*". In practice, if the high amenity area did apply, the limit would be 35 dB L_{A90}, no lower. The modelling predicts that the noise levels at the Waltons' property at wind speeds of 8 m/s will be 37 dB L_{A90}, which is not significantly higher than 35 dB L_{A90}. Figure 4 of the Noise and Vibration Assessment indicates that at the lower wind speed of 6 m/s, the sound power for the candidate Sevion and Vestas turbine are 4.2 dB and 6.9 dB lower respectively. This suggests that at wind speeds of 6 m/s, the high amenity noise limit is likely to be met anyway.

(iii) High amenity limit in the Rokewood township

The township of Rokewood and surrounding areas are located within the 35 to 40 dB predicted noise contour. The township itself is in the Township Zone, while the surrounds have lots that are in the LDRZ. The Panel is not aware of any other wind farm project in Victoria with a township located within the 35 to 40 dB contour.

This calls for the Panel to consider whether the township and surrounding LDRZ land are high amenity areas that should have the lower noise limit set out in the New Zealand Standard.

Evidence and submissions

The EES addresses the question of whether the lower noise limit for high amenity areas should apply, including for the Rokewood township (Township Zone) and the surrounding LDRZ. The discussion is contained in Appendix H to the Land Use and Planning Report (Technical Appendix M to the EES). It concluded that:

In the case of the Cherry Tree Wind Farm, the VCAT determination was that the Farming Zone did not warrant the application of a high amenity limit on the grounds that the relevant planning scheme did not promote a higher degree of protection of amenity related to the sound environment. While the Cherry Tree Wind Farm VCAT decision did not specifically consider other land zones, applying the same reasoning to the areas around the Project indicates that the high amenity limits would not apply to the Township Zone and LDRZ either.

The [relevant] purpose of the LDRZ is:

- *To provide for low-density residential development on lots which, in the absence of reticulated sewerage, can treat and retain all wastewater.*

The [relevant] purpose of the Township Zone is:

- *To provide for residential development and a range of commercial, industrial and other uses in small towns. To encourage development that respects the neighbourhood character of the area.*
- *To allow educational, recreational, religious, community and a limited range of other non residential uses to serve local community needs in appropriate locations.*

Further, a schedule to this zone may contain the neighbourhood character objectives to be achieved for the area. However, there are none in the Golden Plains Planning Scheme.

It is clear that the purpose of the Farming Zone is to promote and encourage agricultural uses rather than high standards of residential amenity. Neither these purposes nor any other provision of the Golden Plains Planning Scheme indicates that these zones are intended to 'promote a higher degree of protection of amenity related to the sound environment of a particular area'.

When considering the requirements of Section 5.3 of [the New Zealand Standard] it is not possible for the 'high amenity' noise limit to be considered. There is no plan, policy, assessment or otherwise within the Golden Plains Planning Scheme to suggest that the area and surrounding environs warrant consideration of a high amenity noise level as described in [the New Zealand Standard].

It goes on to state (in summary) that:

- The definition of 'noise sensitive location' in the New Zealand Standard includes any land zoned predominantly for residential use and other sensitive uses such as schools. Therefore, in order to qualify for the higher protection, the planning scheme needs to confer an additional level of protection beyond simply characterising an area as one for residential land use.
- Even if a high amenity area did exist, the lower noise limit would be irrelevant, because the Noise Assessment demonstrates that at wind speeds of 6 m/s (which triggers the application of the high amenity limit), there are no non-stakeholder receivers within the 35dB noise contour.

The Panel questioned the Proponent further as to whether a high amenity limit should be considered for the Rokewood township and surrounding area, given *Cherry Tree* was only concerned with land in the Farming Zone and could be distinguished on that basis. The Proponent responded that the *Cherry Tree* reasoning should nevertheless be applied. It submitted that:

In regard to the Township Zone and Low Density Residential Zone (LDRZ) at Rokewood, neither of these zone purposes, nor the neighbourhood character objectives for the LDRZ, describe, expressly or by implication, those locations as promoting a higher degree of protection relating to the sound environment.

Discussion

The Panel is not convinced by the Proponent's submissions, or the analysis in the Land Use and Planning report.

When the Golden Plains Planning Scheme is read as a whole, the Panel considers that some zones, expressly or by implication, seek to provide a higher degree of amenity than others. For example, it is uncontroversial that land within the General Residential Zone can expect a higher degree of amenity than land within an Industrial Zone. This is by virtue of a combination of the purposes of the zones, the types of land uses encouraged or restricted in the zones, and the various exemptions and restrictions that apply under each zone.

The Panel considers that the Township Zone and the LDRZ seek to provide a higher degree of amenity than the Farming Zone. The purposes of the Township Zone and the LDRZ seek to encourage residential development and (in the case of the Township Zone) a range of complimentary non-residential uses in small towns, whereas the Farming Zone seeks to encourage agricultural uses. By their very nature, one would ordinarily expect a higher degree of amenity in residential areas than in farming or agricultural areas.

This is reflected in the types of uses encouraged or prohibited in the different zones. For example, the Township Zone and the LDRZ prohibit a range of high amenity impacting uses such as Industry, Stone extraction and Intensive animal husbandry. These uses are not prohibited in the Farming Zone. Rather, prohibited uses in the Farming Zone are those that could be incompatible with agricultural uses (such as child care centres and office). None of the uses prohibited in the Farming Zone are those that are typically high amenity impacting.

The difference in amenity expectations between the Farming Zone and rural residential areas is expressly acknowledged in Planning Practice Notes. *Planning Practice Note 37: Rural Residential Development* states (Panel's emphasis):

Because of its primarily residential function, rural residential development requires access to most of the normal services and infrastructure provided in urban settlements. Typically, it also generates urban residential amenity expectations.

This can be contrasted with *Planning Practice Note 42: Applying the rural zones*, which states (Panel's emphasis):

The Farming Zone is designed to encourage diverse farming practices, some of which can have significant off-site impacts. For this reason, the level of amenity that can be expected in this zone will usually not be compatible with sensitive uses, particularly housing.

Accordingly, the Panel does not agree with the Proponent that the *Cherry Tree* reasoning can simply be extended to the Township Zone and the LDRZ. *Cherry Tree* analysed the particular controls contained within the Farming Zone, and determined that those controls “*encourage agricultural use, which is not an inherently quiet land use*”. Residential uses, on the other hand, are inherently quiet – at least to a greater degree than agricultural uses (and indeed wind farms).

If the Panel accepted the Proponent's argument that the high amenity areas did not apply to Rokewood, it is hard to envisage when it could ever apply. Take, for example, the Neighbourhood Residential Zone. This is arguably the VPP zone which has the highest expectation of protection of amenity. The purposes of that zone (which are fundamentally similar to the purposes of the Township Zone) are:

- *To recognise areas of predominantly single and double storey residential development.*
- *To manage and ensure that development respects the identified neighbourhood character, heritage, environmental or landscape characteristics.*
- *To allow educational, recreational, religious, community and a limited range of other non-residential uses to serve local community needs in appropriate locations.*

The purposes of the Neighbourhood Residential Zone do not explicitly “*promote a higher degree of protection of amenity related to the sound environment of a particular area*”. Nevertheless, if areas zoned Neighbourhood Residential were not regarded as high amenity areas for the purposes of the New Zealand Standard, what areas could be?

On the basis of a broader analysis of the Golden Plains Planning Scheme and related practice notes, the Panel concludes that the Township Zone and the LDRZ implicitly promote a higher degree of amenity in relation to the sound environment. The Rokewood township and the surrounding area is, in the Panel’s view, a high amenity area.

The question then becomes, should the high amenity noise limits prescribed by the Standard apply? This requires an analysis in accordance with Clause C5.3.1 of the Standard. While the data in the EES indicates the town is inside the 35 dB contour (C5.3.1(a)) and the difference between night time background noise and predicted levels is greater than 8 dB (C5.3.1(e)), it is not the role of the Panel to conduct this analysis and make a determination. This is a matter that will need to be addressed by the Proponent and the Responsible Authority. In the Panel’s view, this can be addressed in the further pre-construction noise assessment required under the proposed permit conditions.

For completeness, the Panel notes the conclusion in the Land Use and Planning Report that even if a high amenity area did exist, the lower noise limit would be irrelevant, because the Noise Assessment demonstrates that at wind speeds of 6 m/s, there are no non-stakeholder receivers within the 35dB noise contour. In the Panel’s view, this does not go to the question of whether the Rokewood township and surroundings is a high amenity area. Rather, it goes to the question of whether the wind farm can comply with the high amenity limits. In this regard the Panel notes the 6 m/s predictive noise modelling was undertaken using the Vestas turbine only, which is 6.3 dB quieter than the Sevion turbine at this wind speed.

(iv) Findings

The Panel finds:

- It is not persuaded that it is appropriate to characterise properties in the Farming Zone as being in a high amenity area, and subject to the high amenity limits.
- In the Panel’s opinion, the Rokewood township and the surrounding LDRZ area is a high amenity area.

8.7 Special audible characteristics

(i) Introduction

The Panel understands special audible characteristics to be those distinct audible sounds that can be readily discerned from the more broadband noise from the wind farm. These sounds may be repetitive and of short duration or of a single frequency. Their distinctive character can be annoying. Hence the New Zealand Standard encourages wind farm design that ensures an absence of these special audible characteristics or, failing that, imposes a noise penalty of up to 5 dB.

(ii) Evidence and submissions

Dr Thorne described a characteristic noise from a wind farm as ‘rumble-thump’, or a ‘boot in a dryer’. Submissions suggested that these potentially unusual and repetitive noises may cause unreasonable annoyance, particularly at night. The Panel heard that factors such as wind turbine spacing, rotor size, inversions, wake turbulence and wind shear can result in increased sound pressure levels, beating and directional effects enhancing propagation. Some submitters suggested that these types of noise characteristics may contribute to adverse health aspects being experienced around some wind farms.

It was submitted to the Panel that as a precautionary measure the special audible characteristics penalty should be added to the predicted noise levels. However, while Dr Thorne, Mr Evans and Mr Delaire agreed there is potential for the wind farm to produce special audible characteristics, they also agreed it should be assessed during commissioning and operational compliance testing in accordance with the New Zealand Standard, rather than being applied to prediction modelling.

(iii) Discussion

The Panel is not persuaded that it is reasonable or fair to apply the special audible characteristic penalty prior to construction. It is normal and reasonable for wind farm noise predictions at the planning stage to be predicted with the assumption that no penalties for special audible characteristics would apply. The Panel does not consider it appropriate to simply transfer some experiences or sound characteristics from other wind farms (as described by Dr Thorne) to this proposal, and assume that special audible characteristics will be present.

The Panel understands that turbine manufacturers guarantee their machines being free of certain undesirable acoustic characteristics, notably distinctive tones. The Panel thinks it unlikely that a manufacturer would offer a turbine with known characteristics when the consequence could be a substantial noise penalty. Similarly, the Panel considers that the Proponent will design the turbine configuration, as far as possible, to reduce the likelihood of special audible characteristics, so as to avoid the 5 dB penalty.

However, the existence of special audible characteristics is essentially unknown until a post-construction compliance assessment is made. This reinforces the Panel’s view that it is not appropriate to apply the special audible characteristic penalty prior to construction.

The Panel is satisfied that special audible characteristics can be assessed and managed through appropriate permit conditions. Specifically, if they are found to exist, the penalty will be applied and the operator will have to modify operating conditions to either eliminate the special audible characteristic, or reduce the noise to meet the penalty.

(iv) Findings

The Panel finds:

- It is not appropriate to apply a penalty for special audible characteristics up front. The presence of special audible characteristics can only be determined when the wind farm is operating.
- If special audible characteristics are found to be present when the wind farm is operating, the penalty set out in the New Zealand Standard will apply and the operator will have to modify operating conditions to either eliminate the special audible characteristics, or reduce the noise emissions from the wind farm to meet the limits with the penalty applied.
- The permit condition requiring the post-construction noise compliance assessment should specifically include a requirement to assess and manage special audible characteristics.

The Panel has included a suitable condition in Appendix F.

8.8 Wind farm construction noise

(i) Evidence and submissions

The evidence of Mr Delaire and Mr Evans in relation to construction noise was consistent with the findings and conclusions of the Noise and Vibration Assessment and the Peer Review (discussed in Chapter 8.2(i) above). Their evidence in relation to construction noise and vibration was not contested during the Panel hearings.

Earth Resources Regulation (ERR) forms part of the Resources Division within DEDJTR. ERR administers the MRSD Act. ERR's submission to the ESS advised that it was not satisfied that the current draft of the quarry Work Plan adequately addresses the risks associated with blasting and the potential noise and vibration impacts from the quarry or the construction of wind turbine foundations. ERR indicated that as part of finalising the quarry Work Plan, it is likely to require:

- a blasting impact assessment
- blast monitoring once the quarry is operating
- adaptive management measures in light of any monitoring data obtained.

Mr Delaire and Mr Evans both supported the advice of ERR in their expert witness statements. The Proponent did not contest ERR's advice.

(ii) Discussion and findings

Construction noise sources include construction of turbine foundations, construction of ancillary infrastructure such as access tracks and connection infrastructure, and erection of the turbines. Heavy goods vehicle movements to and from the site will generate off-site noise.

Construction mostly occurs some distance from noise sensitive receivers, with the majority of the work occurring during normal working hours.

A temporary quarry is to be located on the wind farm site, to supply rock for the construction of the Project. The temporary quarry will involve excavation (mechanical extraction processes and blasting), rock crushing, material handling operations, heavy goods vehicle movements and a concrete batching plant.

The Panel is satisfied that risk posed by construction noise and vibration is low and can be acceptably managed through preparation, approval and implementation of the various plans required in the EMMs. The Panel is satisfied that the EMMs are appropriate, and are appropriately implemented through the proposed permit conditions tabled on the final day of the Hearing (Documents 94 and 98).

8.9 Conclusions and recommendations

The Panel finds that potential noise and vibration impacts of the wind farm from construction and decommissioning activities, and potential noise impacts from the operation of the wind farm, are expected to meet the EES evaluation objective. Noise and vibration impacts can be appropriately managed, subject to the implementation of permit conditions. The conditions tabled on the last day of the Hearing by the Proponent and DELWP Planning are generally appropriate subject to the Panel's recommendations set out below.

Specifically, the Panel concludes:

- The noise modelling provides a suitable basis to conclude whether the wind farm is predicted to comply with the applicable noise limits in the New Zealand Standard.
- The background noise monitoring undertaken to date does not comply with the New Zealand Standard. Further background monitoring will be required prior to construction of the wind farm. It must include a minimum of 4,032 valid data points collected for each monitoring location.
- The Farming Zone is not a high amenity area for the purposes of the New Zealand Standard, and it is not appropriate to apply a high amenity limit in the Farming Zone.
- The Rokewood township and surrounding LDRZ area is, however, a high amenity area.
- It is not appropriate to apply a penalty for special audible characteristics up front. The post-construction noise assessment should assess and manage any special audible characteristics that may be present.

The Panel recommends:

Include conditions in the planning permit requiring:

a) the Pre-Construction Noise Assessment to include:

- **a specific acknowledgement that the areas in and around Rokewood that are zoned Township Zone and Low Density Residential Zone are a high amenity area for the purposes of the New Zealand Standard**
- **a requirement to determine whether a high amenity noise limit should apply to these areas, based on the guidance in Clause C5.3.1 of the New Zealand Standard**

- **a requirement for background noise monitoring that include a minimum of 4,032 valid data points collected for each site, analysed by 24 hour and night (10 pm to 7am) only periods, and for each time sector analysed for each 45° wind rose direction**
- b) the Near-field Compliance Testing Report and the Operating Acoustic Compliance Assessment to require the Proponent to assess and manage special audible characteristics.**

These recommendations are reflected in the Panel's recommended conditions contained in Appendix F.

9 Aviation

9.1 Introduction

(i) EES evaluation objectives

The EES scoping requirements sets the following evaluation objective:

- *To manage potential adverse effects for the community, businesses and land uses with regard to aviation safety.*

(ii) Relevant policies and standards

Clause 52.32 of the planning scheme requires the Panel consider the impact of the Project on aircraft safety.

The Victorian Wind Farm Guidelines require decision makers to consider “*the proximity of the site to airports, aerodromes or landing strips, and ensure that any aircraft safety issues are identified and addressed appropriately*”. The Guidelines require permit applicants to consult with the Civil Aviation Safety Authority (CASA) where proposals are located within 30 kilometres of a declared aerodrome or airfield, infringe the Obstacle Limitation Surface (OLS) around a declared aerodrome, or include buildings or structures higher than 110 metres above ground level.

(iii) Background

The Project site is located in an agricultural area that is widely used for cropping and grazing. Aerial agricultural operations occur in the area, including from the private airstrips on the Glenfine property and on the Woods’ property. Turbines and meteorological masts can pose a hazard to aerial agricultural operations.

The EES includes an assessment of aviation impacts prepared by SGS Hart Aviation (Technical Appendix D1). Chiron Aviation Consultants undertook a peer review of SGS Hart’s assessment in relation to the need for aviation safety lighting (Technical Appendix D2). A separate aviation impact assessment (Qualitative Risk Assessment and Obstacle Lighting Review) was also conducted by Chiron (Technical Appendix D3). The Proponent called the author of the Chiron assessment and peer review, Mr Ian Jennings, to give expert evidence before the Panel. His expert witness statement is Document 32.

The issues are:

- impacts on aircraft safety, in particular two private air strips located near the Project site
- impacts on aerial agricultural operations
- impact on aerial firefighting operations
- the need for aviation hazard lighting.

9.2 The aviation safety assessments

The EES aviation assessments investigated potential impacts on airfields, including hang glider and winch or auto tow launched sports aviation operations, Department of Defence operations, aerial agricultural operations, aerial firefighting and ambulance services, and impacts of the wind energy facility on downstream turbulence. They concluded that the Project will not have a significant impact on any aviation operations, provided the proposed EMMs outlined in Chapter 23 of the EES main report are implemented.

The EMMs include:

- provision of endorsed plans to various agencies and entities to ensure the wind farm is shown on aeronautical charts of the area
- preparation and implementation of an Emergency Response Plan in consultation with CFA to provide measures for adequate fire-fighting access within the wind farm when required, including provision for land-based fire-fighting and aerial fire-fighting operations where appropriate
- obstacle marking on meteorological masts is to be provided in accordance with Section 39 of Guideline D prepared under the National Airports Safeguarding Frameworks (NASF) Guideline D.

9.3 Aircraft safety

The Panel heard submissions concerned about the potential impact on aircraft safety from Mr Garnsey, Mr and Ms Wills and Dr Reed in relation to a private airstrip at the Glenfine property, and from the Woods, who have an airstrip on their property in Wingeel Road. The Woods' airstrip is located one kilometre from the closest turbine (GP229). The Glenfine airstrip is located 2.8 kilometres from the closest wind turbine.

Submitters were concerned that turbines present a significant hazard in themselves but will also produce more turbulence and additional risk to small aircraft when undertaking aerial spraying, fighting fires and air ambulance services. There was also a concern that the added turbulence will make aerial spraying less effective, impacting crop yields, and generally, impact asset values and liveability.

Submitters with a direct interest in air safety did not argue for aviation hazard lightly and more generally the Panel only heard submissions opposed to aviation hazard lightly on visual impact grounds.

Aviation hazard lighting and each of the main concerns raised in submissions are explored more fully in the following sections.

9.4 Aerial agriculture

(i) Evidence and submissions

Mr and Ms Woods submitted that the airstrip on their property (which is shared amongst surrounding landowners and used by three commercial agricultural aviation companies) will effectively become unusable because of the location of turbines GP 227, GP 231 and GP 229. They submitted that the nearest airstrip is 15 kilometres away, placing unacceptable additional costs on farmers in the district. The Woods provided letters from Boarder Air, Field

Air and Western Aerial (all local aerial agricultural operators), all corroborating their claim that a take-off toward turbines (GP229, GP231 and GP227) into the prevailing westerly winds does not leave enough safe distance for a loaded agricultural aircraft to gain sufficient height and turn. The Woods also provided letters from 10 surrounding landowners confirming that they rely on aerial agricultural operators that use this airstrip.

The Woods argued that turbine wake affects pose an additional hazard, referring to British Civil Aviation Authority *Policy and Guidelines on Wind Turbines*, and research which shows measurements up to 16 rotor diameters downstream of a wind farm show that turbulence may still be noticeable (at paragraph 2.53). The Woods proposed a minimum 2.4 kilometre setback from turbines. The Woods also claimed that wake turbulence may increase wind speed and turbulence at ground level and therefore make aerial spraying less effective and may cause increased spray drift onto more sensitive crops.

Mr Jennings in his expert witness statement argued *“aerial agricultural operations are only carried out in light to moderate winds, ie, up to 15 kts (7.8 m/s) depending on the type of operation. To this end, the turbulence downwind of wind towers will not be significant, indeed no more than that from lines of tall trees”*.

Mr Jennings argued that any aircraft taking off to the west (towards the wind farm) from the Woods’ airstrip will first have to avoid a Single Wire Earth Return (SWER) powerline (unflagged) running across the extended runway centreline approximately 450 metres from the western end of the airstrip. His evidence was that the most likely avoidance manoeuvre would be a climbing turn before reaching the powerline, which would take the aircraft away from the turbines. By inference the Panel takes Mr Jennings’ evidence to be that a loaded aircraft can take off toward the turbines, reach sufficient altitude and safely turn (to the south or north) before reaching Wingeel Road. He also suggests take-off and landing on a north–south oriented airstrip, such as the intersecting on-farm access road located on the Woods’ property, would keep the aircraft clear of the SWER powerline and the turbines.

In their submission the Woods challenged Mr Jennings’ evidence, arguing that a north–south option does not exist on their property, and would not be viable. They stated that the airstrip is located on an elevated location three metres higher than the SWER, and that no plane has ever turned (including to avoid the SWER) until well after Wingeel Road. They also made the point that at wind speeds of 7.8 m/s both the candidate turbines have almost reached their maximum operating speed, and even when wind speeds at ground level may be lower than this (and suitable for aerial spraying) the windspeed (and wake turbulence) could be significantly higher at the turbine hub height.

Notwithstanding any of the issues raised by the Woods, Mr Jennings’ evidence was that the Civil Aviation Regulations 1998 should be the overriding consideration. Regulation 92 governing aerodromes (the Woods airstrip) requires that a person must not land an aircraft on, or engage in conduct that causes an aircraft to take off from, a place unless, *“having regard to all the circumstances of the proposed landing or take-off (including prevailing weather conditions), the aircraft can do so in safety”*. Mr Jennings stated that it is the responsibility of the pilot to take all the factors (turbines, the SWER, wake effects) into account before deciding whether or not to take off or land. In other words, Mr Jennings did not deny turbines and wake turbulence are a hazard, but rather considered it is the responsibility of the pilot to address the risk and make a safe decision.

In conclusion Mr Jennings says, *“given that the airstrip is used by highly manoeuvrable, purpose built aerial agricultural applications aircraft flown by suitably trained and endorsed pilots, my opinion is that the [Project] will not preclude the safe use of this airstrip and therefore it will remain viable”*. In support, Mr Jennings indicated that Chiron interviewed the chief pilot from Field Air and Border Air, who raised no concerns in relation to the impacts of the Project on the useability of the Woods’ airstrip.

Given the Glenfine airstrip is 2.8 kilometres from the nearest turbine (GP001), Mr Jennings’ evidence was that aircraft taking off to the south east are not flying toward the wind farm and would have sufficient room to manoeuvre clear of the wind farm. For these reasons he was of the opinion that the Project *“will not preclude the safe use of the airstrip on Glenfine and therefore it will remain viable”*.

In final submissions the Proponent submitted that these matters are moot, referring to the findings of the Stockyard Hill panels (2010 and 2017) which concluded that private airstrips cannot expect to dictate land use matters over adjacent land and there is no CASA prescribed or proposed buffer distance for wind turbines adjacent to property boundaries.

(ii) Discussion

In part the Panel accepts the evidence of Mr Jennings and the submissions of the Proponent. It agrees that Regulation 92 of the Civil Aviation Regulations 1998 is an overriding consideration, and that there is no obligation for land use on adjoining properties to provide for the ongoing operation of a private airstrip on a property.

On a first principles basis the Panel acknowledges that wind speed may be higher at the hub than at ground level in wind shear conditions, and turbines may create wake turbulence and potentially increase downwind wind speed at ground level and therefore may make conditions unsuitable for aerial spraying, when they might otherwise be suitable.

The Panel did not, however, receive specific evidence demonstrating that this is actually a significant issue for existing wind farms. In practice aerial spraying contractors already need to assess wind speed and turbulence at ground level before commencing operations and to that extent this potential impact will need to form part of this consideration. Turbulence, whether generated by a wind farm, convection, adverse weather conditions, terrain or obstacles, is one of numerous hazards a responsible pilot needs to consider and manage when planning and operating an aircraft. Overall the Panel considers that this issue is manageable and is certainly not so significant that the wind farm should not be approved, or turbines removed.

In relation to the Woods’s airstrip, the Panel had difficulty with Mr Jennings’ evidence in that he has not engaged enough with the Woods, or conducted an adequate inspection of the airstrip. The Panel has some doubt as to whether he engaged sufficiently with the commercial operators in relation to the current operational parameters at this airstrip, as his evidence was contradicted by the letters provided by the Woods from Boarder Air, Field Air and Western Aerial.

It would have been useful to the Panel for Mr Jennings to have presented specific evidence on the types of aircraft that actually use the strip, and their climbing rates, distances and safe turning points and directions, to support his opinion and demonstrate the EES evaluation

objective is met. In the absence of this specific evidence, the Panel is not convinced the Woods airstrip will remain viable. While the Panel agrees Civil Aviation Regulations 1998, Regulation 92 is important, it may indeed be unsafe to take-off to the west much of the time, making the airstrip potentially unviable.

The Terms of Reference require the Panel to report on whether and how the Project meets the evaluation objective *“to manage potential adverse effects and benefits for the community, businesses and associated land uses”*. The Woods’ airstrip provides a service to several farmers in the district, and provides wider social (use of local businesses), economic (lower cost of aerial spraying) and environmental (reduced greenhouse gas emission) benefits. In addition, the Panel has the sense that the Proponent is motivated to build community goodwill and trust and in effect gain a ‘social licence’ to operate. If indeed the Woods airstrip is made unviable as a result of the Project, this would seem inconsistent for a Proponent looking to gain a ‘social licence’ with the community.

Due to the inconsistencies between Mr Jennings’ evidence and the letters from the various aerial agricultural operators presented by the Woods, the Panel has not been able to conclude whether the Woods’ airstrip will be made unviable or not, and therefore the matter is unresolved.

The Panel does not consider it appropriate to arbitrarily recommend the removal of turbines if the matter is uncertain and unresolved. Equally, it is not appropriate to approve turbines which may render the airstrip practically unviable.

The Panel concludes that further assessment is required in relation to the safety impacts of turbines GP 227, GP 231 and GP 229 on the Woods’ airstrip. Before these turbines are constructed an aircraft safety assessment should demonstrate that the safe operation of the Woods’ airstrip will not be significantly impacted by these turbines; or unless a satisfactory alternative arrangement is agreed between the parties.

(iii) Findings

The Panel finds:

- Turbines GP 227, GP 231 and GP 229 should not be constructed until an aircraft safety assessment has been prepared to the satisfaction of the responsible authority that demonstrates that the safe operation of the Woods’ airstrip will not be significantly impacted by these turbines; or unless a satisfactory alternative arrangement is agreed between the parties.

9.5 Aerial fire fighting

(i) Evidence and submissions

Submissions raised concerns about the Project impacting on the safe operation of aerial firefighting services. Submissions are concerned that aerial fire fighting would not be possible amongst the turbines and aircraft play a key role in suppressing fast moving grass fires.

Firefighting aircraft are usually aerial agricultural applications aircraft or at times specifically modified civil or military aircraft flown by appropriately endorsed pilots. These pilots are licenced under Civil Aviation Regulations 1998.

Mr Jennings in his evidence noted that the rural firefighting agencies in Victoria, New South Wales, South Australia and Western Australia all view wind turbines and wind farms to be ‘just another hazard’ that has to be considered in the risk management process associated with aerial firefighting. His evidence was that access for fire trucks and personnel, and consequently their ability to fight the fire within a wind farm, is greatly enhanced by the access roads built for the construction and maintenance of the turbines. These agencies apparently also say roads act as fire breaks which can slow or contain the fire spread across the open ground. Further, the area around the base of each tower is kept clear of vegetation and as such offers a refuge for fire fighters and their vehicles.

At the hearing Mr Jennings provided video footage of an Air Tractor AT802 (with ground-based fire fighting) operating within a wind farm. Mr Jennings’s expert witness statement shows (in Appendix E) photographs of ground based firefighting assets along the roads constructed within windfarms and the clear areas around the base of the turbine towers.

The Australian Fire and Emergency Service Authorities Council *Wind Farms and Bushfire Operations Position Paper* (30 October 2014) states:

Aerial firefighting operations will treat the turbine towers similar to other tall obstacles. Pilots and Air Operations Managers will assess these risks as part of routine procedures. Risks due to wake turbulence and the moving blades should also be considered. Wind turbines are not expected to pose unacceptable risks.

The CFA has published *Emergency Management Guidelines for Wind Energy Facilities in Victoria* (August 2017). With respect to managing impacts on aerial firefighting operations, the guidelines state:

Wind turbines should be located approximately 300 metres apart. This provides adequate distance for aircraft to operate around a Wind Energy Facility given the appropriate weather and terrain conditions. Fire suppression aircraft operate under “Visual Flight Rules”. As such, fire suppression aircraft only operate in areas where there is good visibility and during daylight hours. Wind turbines, similar to high voltage transmission lines, are part of the landscape and would be considered in the incident action plan.

The Proponent advises that all turbines are spaced well over 300 metres apart.

(ii) Discussion

The Panel did not receive any evidence about the extent to which aerial firefighting facilities are used in the area or may be used in the area in future. The Panel notes the CFA did not object to the Project or raise any concerns in relation to its impacts on aerial firefighting operations. The CFA has previously advised the Stockyard Hill Planning Panel (August 2010) that wind farms do not create a tactical disadvantage in firefighting.

The Panel was not persuaded by the concerns of submitters that the Project would result in any significant change in the ability to fight fires using aircraft. That said, the Panel recognises that the effectiveness of such operations may be limited, just as they could be by other wind farms. This is a matter for expert firefighting operators to consider and is adequately addressed by the requirement in proposed permit conditions that the Proponent provide a

copy of the endorsed plans to any organisation responsible for providing aerial fire-fighting, air ambulance and search and rescue in the area.

The EMMs in Chapter 23 of the EES propose that before development starts, “an *Emergency Response Plan is to be prepared in consultation with the CFA and Rural Ambulance Victoria and endorsed by the responsible authority as part of the Project EMP. The Emergency Response Plan will outline measures to provide for adequate fire-fighting access within the windfarm when required, including provision for land-based fire-fighting and aerial fire-fighting operations where appropriate.*” The Panel is satisfied that this EMM (which is reflected in the proposed permit conditions tabled on the final day of the Hearing) will adequately address the impacts of the wind farm on aerial and ground based firefighting operations.

(iii) Findings

The Panel finds:

- there is insufficient evidence to persuade the Panel that the Project will significantly impact on aerial firefighting operations.

9.6 Hazard lighting

(i) Evidence and submissions

The SGS Hart impact assessment (EES Appendix D1) concluded:

Whilst the risk to aviation operations in the vicinity of the proposed Golden Plains Wind Farm is considered to be low – medium, there is sufficient evidence to suggest that the wind farm will be in an area where the presence of aviation operations will not be unlikely and the fact that the proposed wind turbines will penetrate navigable airspace warrants the provision of obstacle lights.

The Proponent engaged Chiron Aviation Consultants to undertake a peer review of the SGS Hart report (EES Appendix D2). Chiron concluded that the SGS Hart report did not provide evidence to support its conclusion, that a risk assessment was required and the proposition that navigable airspace is down to 500 feet (about 150 metres) above ground level is incorrect.

Chiron was then engaged to undertake an Aviation Impact Statement, Qualitative Risk Assessment and Obstacle Lighting Review (Technical Appendix D3). This report found that even though the turbines have a tip height of 230 metres and therefore can be regarded as an obstacle, the overall risk to aviation in the area is low, and on this basis no further mitigation (including aviation obstacle lighting) is required. This conclusion was based on the Project site not being within the vicinity of any certified or registered aerodrome and does not penetrate any Obstacle Limitation Surface (OLS) and Procedures for Air Navigation Services – Aircraft Operation (PANS-OPS) airspace.

DELWP Planning had no formal position on aviation lighting. It did, however, refer the Permit Application to CASA on an informal basis and provided a copy of CASA’s response (submission PP29). CASA recommended that the wind farm be lit with steady red medium intensity lighting at night and the lighting plan to install obstacle lighting on 99 of the 228 wind turbines is acceptable. CASA says their assessment was conducted consistent with *Managing the Risk*

to *Aviation Safety of Wind Turbines Installations (Wind Farms)/Wind Monitoring Towers*, Guideline D prepared under the NASF. Mr Jennings gave evidence that CASA can only make recommendations regarding the lighting of wind farms, and not determinations or directions mandating lighting of wind farms that are more than 30 kilometres from a certified or registered aerodrome. Ballarat and Avalon aerodromes (the closest certified or registered aerodromes) are more than 30 kilometres from the wind farm.

The Proponent speculated that CASA's submission appears to merely confirm a lighting plan that the Proponent submitted to CASA in mid-2017, which was under consideration at the time. Mr Jennings indicated that to the best of his knowledge CASA has never undertaken a risk analysis as required by NASF Guideline D (paragraphs 33 and 34) to determine whether or not aviation night lighting should be included on the proposed wind farm.

In relation to whether or not the Project penetrates navigable airspace Mr Jennings indicated that according to Visual Flight Rules an aircraft flying away from a populous area is, when flying below 3000 feet (about 900 metres), required by Civil Aviation Regulation 1998, Regulation 157 to remain at 500 feet (about 150 metres) above the highest point of the terrain and any obstacle on it within a radius of 600 metres (300 metres for a helicopter) from a point on the terrain directly below the aircraft. For the Project this equates to 500 feet (about 150 metres) above the turbine tip height, this is 380 metres (1255 feet) above ground level. This height must be maintained unless "*due to stress of weather or any other unavoidable cause it is essential that a lower height be maintained*". In relation to this exception Mr Jennings argued that it is possible that due to lowering cloud base, and if through poor airmanship the aircraft had pressed on to the point that it was unable to execute a turn and fly away from the weather, an aircraft could find itself lower than 500 feet (150 metres) above the terrain or obstacles. He also said the operative word is 'unavoidable'. His view was that flying into marginal or non Visual Meteorological Conditions (VMC) is avoidable.

The Chiron Aviation Consultant report (Technical Appendix D3) recommended turbines and meteorological masts be:

- appropriately marked except for the strobe light
- reported as tall structures in accordance with AC139-08
- notified to the Aerial Agricultural Association of Australia
- notified to local Aerial Agricultural Applications operators
- notified to the Emergency Services aviation groups in Victoria
- notified to the aerodrome operators at Ballarat, Bacchus Marsh, Avalon and Lethbridge Park.

The Panel received submissions opposing aviation hazard lighting on turbines, based on the visual impact and its impact on birds and bats. Mr Wyatt's evidence was that although the visual impact of aviation hazard lighting would be low, it was nevertheless preferable not to have it. Birdlife Australia submitted that aviation hazard lighting may attract birds, particularly nocturnal migratory birds. Birdlife Australia drew the Panel's attention to a 2009 paper by the New Zealand Department of Conservation (*Impacts of wind farms on birds: a review*) which concluded that:

The issue of these lights attracting or confusing nocturnally migrating birds and resulting in them colliding with turbines has been a concern for wildlife agencies, and therefore needs to be considered in detail when assessing risk.

The Victorian Wind Farm Guidelines indicate that *“lighting may disorient birds at night, increasing collision risk”*.

(ii) Discussion

Aviation safety lighting is not prescribed under the planning scheme or the Victorian Wind Farm Guidelines. However, the Guidelines do acknowledge the potential impact of aviation safety lighting on amenity and set out a range of potential mitigation measures.

It would have been helpful to the Panel for CASA to have provided its assessment and the evidence it relied upon to support its recommendation. In absence of this, the Panel has explored Guideline D. Under paragraph 34, when CASA is provided with a risk assessment it has two choices. It can determine that the wind farm is:

- hazardous, but that the risks to aircraft safety could be reduced by the provision of approved lighting and/or marking
- not a hazard to aircraft safety.

It appears CASA did not agree with Mr Jennings that the Project does not pose a hazard to aircraft safety. The Panel agrees with CASA. The Project will always present a hazard to aircraft. Flight rules, electronic alerts, no fly zones and indeed lighting may be deployed to lower the risk, but the hazard itself can never be eliminated.

It seems that CASA may therefore have been left with only one choice when applying Guideline D – that the Project is hazardous, but that the risks to aircraft safety could be reduced by the provision of approved lighting.

This may be true, but it is not clear to the Panel that CASA has fully and properly assessed the merits of the Chiron risk assessment. It appears to the Panel that CASA has failed to consider a perfectly reasonable third choice – that the Project is hazardous, but the risk is acceptably low and therefore lighting is not required.

The Panel notes that this third option is not included in Guideline D. However, Guideline D is not incorporated or referenced in the planning scheme and is not called up by Clause 52.32 or the Victorian Wind Farm Guidelines. The Panel has weighted Guideline D accordingly.

Based on the EES and the evidence of Mr Jennings the Panel accepts that CASA does not have authority to mandate aviation hazard lighting where the obstacle is beyond an aerodrome OLS and does not penetrate the PANS-OPS surfaces or any other prescribed airspace. CASA is also not a formal referral authority (determining or recommending) for the Permit Application. Its comments are therefore not binding on the Responsible Authority.

The Panel also notes previous CASA advice documented in the Panel report for Stockyard Hill Wind Farm (August 2010) when it gave public notice on its web page under the heading *‘Taking a fresh look at wind farms’* and in later correspondence with the wind industry CASA advised:

The Civil Aviation Safety Authority’s (CASA) statutory power to require obstacle marking and lighting on obstacles under Civil Aviation Safety Regulation Part 139 only applies within the vicinity (approximately 30 km) of an aerodrome. CASA cannot mandate the lighting or marking of structures outside aerodromes. It is CASA’s view that this is a decision for, and the responsibility

of, the developer. Any associated requirements placed on developers by planning authorities, insurers or financiers are beyond CASA's scope.

The Proponent has carried out its own assessment of the need for safety lighting on turbines and has concluded that it is not required. This was supported by uncontested expert evidence at the Panel hearing.

The Panel accepts the evidence of Mr Wyatt that aviation hazard lighting has unwanted visual impacts. It also accepts the submissions of Birdlife Australia and others that aviation hazard lighting can impact on birds and bats, particularly nocturnal species. Previous Panels have found that the visual impact of aviation hazard lighting is not acceptable (see for example Stockyard Hill Panel Report, August 2010, page 149).

The Panel is not persuaded that the Project presents unacceptable risk to aviation safety to warrant a requirement for aviation hazard lighting on turbines. The Panel considers that any benefits of aviation hazard lights are likely to be outweighed by the potential visual and ecological impacts. On balance, the Panel considers that turbines without aviation hazard lights are able to meet the EES evaluation objective of managing potential adverse effects with regard to aviation safety.

The Panel supports the recommendation and proposed conditions in relation to meteorological masts.

(iii) Findings

The Panel finds:

- Aviation hazard lighting on turbines is not required.

9.7 Conclusions and recommendations

The Panel concludes that, subject to the matter of the Woods' airstrip being resolved satisfactorily, and subject to the EMMs being implemented, the Project will meet the EES evaluation objective of managing potential adverse effects with regard to aviation safety.

In relation to the Woods' airstrip, the Panel recommends:

Include a permit condition that provides that prior to turbines GP 227, GP 231 and GP 229 being constructed, the Proponent must provide an aircraft safety assessment by a suitably qualified person which demonstrates that the existing operations conducted from the airstrip at 1944 Wingeel Road, Barunah Park will be able to continue safely without significant impact from the turbines, to the satisfaction of the Responsible Authority, unless a satisfactory alternative arrangement is agreed between the parties.

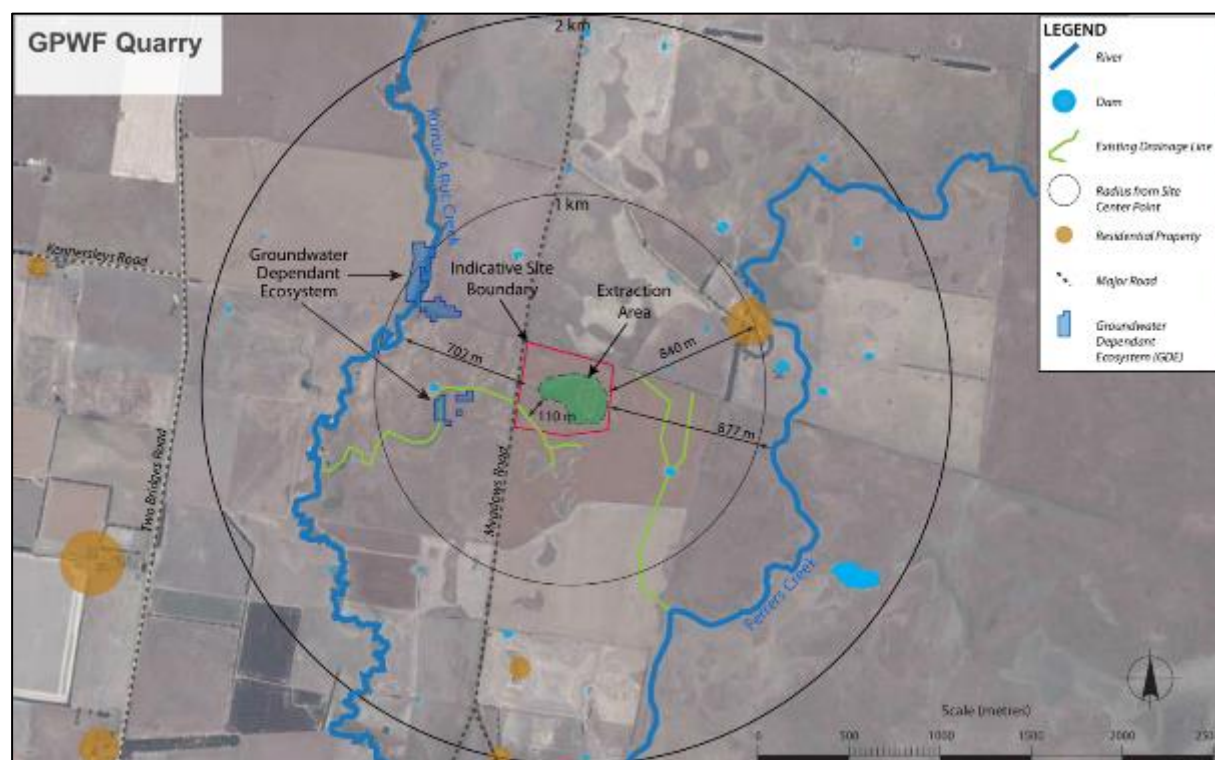
The Panel has included a suitable condition in its recommended conditions in Appendix F.

10 Quarry

10.1 Introduction

A temporary quarry and concrete batching plant are proposed to be located on the east side of Meadows Road, approximately 4 kilometres to the south of the township of Rokewood (Figure 5).

Figure 5 Location of the temporary quarry



(i) EES evaluation objective

There is no specific EES evaluation objective for the quarry, however a number of the objectives relating to biodiversity, landscape and visual amenity, land use and socio-economic impacts, community amenity, roads and transport, cultural heritage and catchment values evaluation objectives are relevant. The EES states in relation to air quality:

The assessment of potential dust impacts from the proposed quarry should be consistent with the requirements of EPA Victoria's Protocol for Environmental Management: Mining and Extractive Industries (EPA, 2007). Key air indicators for assessment were Particulate Matter 10 (PM₁₀), Particulate Matter 2.5 (PM_{2.5}), and deposited dust.

(ii) Relevant policies and standards

The specific legislative and policy framework applicable to the quarry is outlined in Chapter 3 of the EES. Other approvals and policy applicable to the quarry are outlined in Chapter 3 of this Report. The primary approval required for the quarry is a Work Plan and Work Authority under the MRSD Act. A Work Authority (WA006594) has been issued under the MRSD Act,

and a draft Work Plan (PLN-000834, EES Appendix G) has been prepared and will need to be finalised and endorsed by the Earth and Energy Resources division of DEDJTR (EER).

(iii) Background

The quarry will produce an estimated total of 1,200,000 tonnes of crushed rock to be used for construction of internal access roads, turbine hardstands, power pole hardstands and concrete aggregate. In addition, general and bulk fill may be required to upgrade or remediate local public roads which need to be upgraded to facilitate the construction of the wind farm or which sustain wear beyond normal use during the construction.

Information on the quarry and the site selection process is provided in Section 5.5 (project components) and Section 6.5 (designing the wind farm layout) of the EES main report. The movement of aggregate material from the proposed quarry to construction sites will be predominantly via internal haul roads established as part of the construction. The quarry will be excavated to a depth of approximately 3 metres above the water table. The quarry will require a water supply for dust suppression and concrete manufacturing. The proposed water supply requirements will be met via three standpipes. Should groundwater be utilised, licenses will be required under section 51 of the Water Act to take and use groundwater, and under section 67 of the Water Act to construct and operate a bore.

The impacts of the quarry are considered in the Technical appendices containing the assessments for noise and vibration, Aboriginal cultural heritage, traffic and transport, social impact, surface water, and visual impact. In addition, the Proponent has undertaken a number of specific technical studies in relation to the quarry:

- Appendix C – Quarry air quality impact assessment report
- Appendix G – Quarry flora and fauna impact assessment report
- Appendix J – Quarry groundwater risk assessment.

Chapter 23 (Environmental management framework) of the EES proposes that the primary mechanism to manage potential quarry impacts is through the preparation and implementation of an approved Work Authority and Work Plan. The Work Plan provides an integrated framework and sub-plans that address ecological, air quality, surface water, noise and vibration, social, traffic and heritage matters. The concrete batching plant on the quarry site and other locations elsewhere will be managed in accordance with *EPA Publication 628: Guidelines for the Concrete Batching Industry (1998)*.

10.2 Air quality

The EES air quality impact assessment (Technical Appendix C, *Air Quality Impact Assessment Report for Quarry*) used AERMOD in accordance with the EPA publication 1551 (October 2013). The assessment predicted no exceedances for all modelled receptor points outside the quarry site boundaries, apart from some exceedances for PM₁₀ and PM_{2.5} occurring close to the quarry's boundaries. There were no exceedances for dust deposition.

The air quality assessment and potential impact of dust was not contested at the Hearings. Based on the evidence before it (namely that contained in the EES), the Panel concludes that dust is a low risk and subject to implementation of the quarry Work Plan and the other EMMs, the quarry is expected to meet the EES evaluation objectives relating to air quality.

10.3 Other impacts

(i) Evidence and submissions

ERR provided a detailed submission on the Project and specific comments on the draft Work Plan. ERR recommended the final Work Plan will need to address:

- a blasting impact assessment and blast monitoring plan
- the risk of destabilising the progressive filling of the quarry as a result of blasting
- an assessment of the risk associated with the onsite detention and sedimentation basins.

In conclusion ERR *“believes that the quarry can be successfully regulated under the MRSD Act and other relevant legislation to achieve acceptable environmental and social outcomes”*, and that *“the project as described in the draft quarry Work Plan is technically sound, subject to the work plan addressing a range of issues and risks, including those mentioned in this submission”*.

The Panel heard submissions from Mr Delpratt and Mr Kern who argued that the quarry site should be protected, and rock sourced from elsewhere in the district. They claimed that the quarry is a prominent and rare remnant feature in the landscape, with important geological, landscape, ecological and Aboriginal cultural heritage value.

(ii) Discussion

The assessments undertaken for the EES show the presence of archaeological material and some remnant native vegetation on the quarry site. However, no submitters were able to draw the Panel’s attention to any policy document which recognised and protected the geological features on the quarry site. Likewise, the Panel was not made aware of any specific ecological, cultural or landscape feature of the site that is so significant that would justify protection.

With the exception of air quality, the specific impacts of the quarry are largely addressed in other issue-based Chapters of this Report. For completeness, the following is a summary of the key impacts of the quarry:

- **Flora, fauna and MNES** – The flora and fauna assessment identified five remnant patches (0.47 ha) of Heavier-soils Plains Grassland (EVC 132_61), one of which comprised Natural Temperate Grasslands of Victorian Volcanic Plains which is listed under the EPBC Act. No other EPBC Act listed flora and fauna species were recorded on the quarry site. The quarry will result in the loss of 0.13 ha of native vegetation. Offset sites will be secured in perpetuity through on-title agreements in negotiation with relevant landowners and agencies.
- **Aboriginal cultural heritage** – A cultural heritage management plan (CHMP) is currently being prepared for the quarry. The CHMP will be evaluated by the Wadawurrung, Wathaurung Aboriginal Corporation as the registered aboriginal party for the area.
- **Ground and surface water** – The quarry is not in a designated Salinity Management Overlay. Based on hydraulic modelling, groundwater data and the proposed quarry floor depth, the quarry excavations are not expected to intercept the groundwater table. Sedimentation basins and bunding will provide sufficient protection to

downstream water quality. Given the low permeability of the basalt rock aquifer and low hydraulic conductivity, it is unlikely that any significant recharge to groundwater from surface water will occur and therefore the risk to groundwater quality is low. Groundwater flow regimes are not expected to be altered, and as such, the risk to groundwater sensitive ecosystems is low. Refer to Chapter 9 for more detail.

- **Visual impact** – The quarry has been designed so that the active face of the quarry is hidden from views from Meadows Road. The visual impact was therefore assessed as low to negligible. Refer to Chapter 7 for more detail.
- **Noise and vibration** – Noise from the quarry was assessed against NIRV. The noise levels at one receiver location were above the NIRV threshold. The quarry Work Plan will document the management and monitoring of noise and vibration levels in accordance with AS2187.2:2006, and DEDJTR guidelines. If the NIRV level cannot be achieved with practical noise mitigation measures, operational noise agreements will be reached with the land owner(s).
- **Traffic and transport** – The provision of an on-site quarry offers a major reduction in trips to and from the site. An estimated 41,193 trips are limited to the road network within the site. Having an on-site quarry will not only reduce the expected level of congestion on the arterial road network, but also result in less potential damage to these road surfaces.

The Panel is satisfied that the concerns of Mr Delpratt and Mr Kern in relation to Aboriginal heritage issues will be addressed through the development and approval of the CHMP. The Proponent will be required to offset the clearing of 0.13 hectares of native vegetation. In the absence of any planning scheme provision or policy document that recognises and protects the geological or other features of the quarry site, the Panel is not persuaded that the quarry site is so important that it should be protected. Not allowing the quarry would have impacts in terms of amenity of the surrounding area, including traffic and transport impacts. Insufficient evidence has been presented to the Panel that persuades it that the benefits of protecting the quarry site would outweigh the impacts.

10.4 Conclusions

The Panel concludes that the potential impacts of the quarry can be appropriately managed. The quarry is expected to meet the relevant EES evaluation objectives, subject to the quarry Work Plan being approved and implemented to the satisfaction of ERR.

11 Surface, groundwater and salinity

11.1 Introduction

(i) EES evaluation objectives

The EES scoping requirements set the following evaluation objectives in relation to 'catchment values':

- *To maintain the functions and values of aquatic environments, surface water and groundwater including avoiding adverse effects on hydrology and protected beneficial uses including downstream biodiversity values and their habitat*

(ii) Relevant policies and standards

Relevant policies include the following:

- Clause 14.02-2S (Water Quality) of the Planning Policy Framework aims to ensure that land use activities potentially discharging contaminated runoff or wastes to waterways are sited and managed to minimise such discharges and protect groundwater resources.
- The *Central Highlands Regional Growth Plan 2014* guides how development will be supported and assessed to improve the management and use of water resources and minimise risks to the environment (including surface water and groundwater supply).
- The Salinity Management Overlay seeks to facilitate stabilisation of areas affected by salinity, reduce salinisation and prevent damage to buildings and infrastructure from saline discharge and a high water table.
- The *Corangamite Regional Catchment Management Strategy 2013-2019 (2013)* and the *Corangamite Waterway Strategy 2014-2022 (2014)* aim to protect the health of river reaches, wetlands and groundwater resources for the environment and current and future users.
- State Environment Protection Policy (SEPP) (Groundwaters of Victoria) and SEPP (Waters of Victoria) protect groundwater and surface water environments and beneficial uses, and set out environmental quality objectives and indicators to measure whether beneficial uses (for example, aquatic ecosystems supported by waterbodies) are being protected.
- Various EPA and other publications provide guidance on avoiding and minimising construction impacts on surface water and groundwater, and storing and handling hazardous substances that could, if spilled, impact on water quality:
 - *EPA Publication 275: Construction Techniques for Sediment Pollution Control*
 - *EPA Publication 480: Environmental Guidelines for Major Construction Sites*
 - *EPA Publication 628: Guidelines for the Concrete Batching Industry*
 - *EPA Publication 347: Bunding Guidelines*
 - *Australian Standard AS 1940:2004 Storage and handling of flammable and combustible liquids*

11.2 The groundwater and surface water assessments

Surface water, groundwater and salinity impacts are dealt with in Chapters 13 and 20 of the EES main report, and in:

- Technical Appendix I – Groundwater Impact Assessment Report, prepared by Australian Water Environments
- Technical Appendix Q – Surface Water Assessment Report, prepared by Water Technology.

Four major waterways (Mount Misery, Kuruc-a-Ruc, Ferrers and Mia Creeks) traverse the Project site, as well as a number of minor, intermittent streams. Parts of the site are covered by a Land Subject to Inundation Overlay (LSIO), which indicates that the relevant land is subject to flooding from the local waterways.

Groundwater is generally expected to be in the order of 5 to 10 metres below natural ground surface, with standing water and ephemeral wetlands often observed. Groundwater depth can fluctuate seasonally. The Project site is not located within a Groundwater Quality Restricted Use Zone or Water Supply Protection Area.

Modelling in the Groundwater Impact Assessment indicates that 19 turbine foundations could potentially intercept shallow groundwater, which would require dewatering of the foundation worksites. Quarry excavations are not expected to intercept the groundwater table.

Small areas within the Project site are affected by Salinity Management Overlays. When groundwater evaporates in salinity affected areas, it can bring salt from underlying fractured basalt to the surface – a process known as salinisation. Construction in areas where saline groundwater is present can also cause salinisation.

According to Chapter 13 of the EES main report, following design modifications only one turbine (GP173) remains within a Salinity Management Overlay (although the Panel notes that turbines GP176, GP182 and GP207 are located very close to, if not on, the boundaries of the Salinity Management Overlay). Soil samples collected from the area indicate that the soil moisture salinity levels were suitable for regular cultivation without intensive soil conservation measures. The quarry is not in a Salinity Management Overlay area.

EMMs have been developed to address potential surface water, groundwater and salinity risks. The Proponent must:

- prepare a Sediment, Erosion and Water Quality Management Plan that addresses the requirements of the relevant SEPPs and EPA Publications. The Plan must be prepared in consultation with the Corangamite Catchment Management Authority (CMA), and must contain:
 - sediment and erosion control measures
 - a monitoring program
 - a complaint investigation and response plan
- prepare an Environmental Management Plan that addresses the objectives of the Salinity Management Overlay
- prepare a Hazardous Substances Management Plan that addresses the requirements of the relevant EPA Publications and AS 1940:2004
- store all hazardous substances in facilities designed and bunded in accordance with those publications

- construct and operate the temporary concrete batching plants in accordance with the relevant EPA Publication.

11.3 Surface water

(i) Evidence and submissions

Several submitters, including Dr Reed, Ms Wills and the Nevilles, raised concerns about the Project's impacts on water runoff and bore water extraction. Submitters were concerned about impacts on bore water required for farming activities, runoff from the terminal station impacting on farming activities, and impacts on wetlands. The Nevilles requested engineering plans and a study to show the impact of the terminal station on water runoff. Corangamite CMA submitted that the Project must not generate offsite hydrologic or hydraulic impacts, or materially change the downstream floodplain storage capacity or flow regimes in the area.

The Surface Water Assessment determined that flooding is relatively confined to the four creeks traversing the site. Seven turbines are located in areas subject to inundation during a 1 in 100 year storm event – four located along Mount Misery Creek and three along Kuruc-a-Ruc Creek. The Assessment concluded that the turbines will not significantly alter surface water flow paths or flood levels in these areas. Nor is the Project likely to impact on the available floodplain storage or downstream flood levels.

The Proponent and the Corangamite CMA have agreed on the drafting of permit conditions (Document 14) designed to address impacts on surface waters and overland flows, including:

- turbine foundations must be located at least 100 metres from the centre line of the four major creeks and at least 30 metres from the centre line of any other designated waterway
- works must be designed to ensure no adverse impacts on off-site hydrologic or hydraulic impacts, overland flow regimes or floodplain storage capacity
- any fill within flood affected areas must be approved by Corangamite CMA.

The Proponent sought further advice in relation the submitters' concerns, particularly those relating to runoff from the terminal station. Advice from Water Technology (Document 43) indicates that the terminal station, while located close to several wetlands, is not located in a defined floodplain. Detailed design for the terminal station would need to include local drainage works (possibly including a retarding basin) to maintain existing flow paths, and some form of treatment may be required to ensure runoff is free from contaminants. Advice from Jacobs (Document 44) was that the various Environmental Management Plans required for construction, operation and decommissioning should include spill controls and bunding measures, a monitoring program to detect leaks and spills, and a complaints process.

(ii) Discussion

The Panel is satisfied, on the basis of the Surface Water Assessment, that the Project will not significantly impact on surface water flow paths around the creeks that traverse the site, on flood levels in these areas, or on the available floodplain storage or downstream flood levels. The conditions agreed between Corangamite CMA and the Proponent (reflected in Document 14) are suitable to ensure that any surface water or flooding impacts can be avoided or managed.

The terminal station is to be located immediately adjacent to a wetland. It will need to be carefully designed and managed to ensure that contaminated runoff to the wetland and surrounding areas does not occur. On the basis of the further advice from Water Technology and Jacobs (Documents 43 and 44), the Panel considers there is no reason why this cannot be managed.

11.4 Groundwater and salinity

(i) Evidence and submissions

The Groundwater Impact Assessment assessed a range of possible risks to groundwater from the Project, including compression of aquifers from turbine foundations, interception of groundwater flows, reduced groundwater recharge resulting from more impermeable surfaces and contamination from the terminal station and concrete batching plants entering groundwater. Most risks occur during the construction phase. With the implementation of EMMs, the risks were assessed as very low to low.

DELWP Environment initially recommended a more comprehensive assessment of the groundwater risk posed by the development, citing concerns over impacts to Brolga, Growling Grass Frog, seasonal herbaceous wetlands and groundwater dependant ecosystems. It also requested a site salinity assessment and management plan, in its capacity as a referral authority for the small parts of the Project site that are subject to a Salinity Management Overlay.

In response to DELWP Environment's concerns about salinity, the Proponent provided further information, prepared by Australian Water Environments and Jacobs (Document 2). The Australian Water Environments advice confirms that:

- monitoring from a bore on the Project site (said to be representative of conditions influencing salinity at the site) confirms with a high degree of confidence that the groundwater level on the site has dropped over recent years
- if this trend continues, less saline groundwaters will be present and the size of salinity affected areas will reduce
- field studies and site sampling indicated that salinity is unlikely to be affected by the one turbine that is located within a Salinity Management Overlay (GP173)
- turbine foundations (if they were to encounter saline groundwater) are unlikely to increase salinisation much beyond the turbine footprint (less than 500 square metres)
- geotechnical investigations will be undertaken to determine the site-specific conditions for designing the infrastructure
- mitigation options are available to manage impacts of the Project on groundwater and salinity, such as:
 - enhanced drainage underneath or around turbine foundations that encounter shallow groundwater
 - constructing and backfilling trenches for underground infrastructure to ensure that subsurface hydraulic flow paths are maintained
 - minimal compaction of access tracks to maintain their permeability
 - constructing spoon drains to prevent pooling of shallow or surface water

- deep-rooted vegetation to reduce increased salt deposits resulting from evapotranspiration.

The Jacobs advice concluded that the groundwater salinity levels in the area are not aggressive and would not preclude the use of concrete, rock bolts or ground anchors and other common infrastructure items associated with a wind farm. Suitable construction materials with a design life of 25 to 35 years are readily available, and a number of Australian and international standards provide guidance on construction and durability of ground anchors and concrete structures.

DELWP Environment responded to the further information in Document 2. The response (Document 13) indicates that *“the information does not entirely address DELWP (Environment Portfolio’s) request, however it provides sufficient information to determine that any salinity matters can be addressed via conditions attached to any permit granted”*. It recommended a condition requiring a salinity assessment report and management plan be included in the permit.

In its submission to the Hearing (Document 71), DELWP Environment withdrew its recommendation for a more comprehensive assessment of the groundwater risk to biodiversity, partly on the basis of the information in Document 2 which demonstrated a reduced salinity risk. Instead, it recommended that the groundwater risk be managed through the Environmental Management Plan, which should include measures to identify and manage risks to susceptible biodiversity values.

According to the Groundwater Impact Assessment, the terminal station is likely to generate wastewater discharges which could pose a risk to the beneficial use of groundwater. However, treatment systems will be in place to ensure fit for-end-use prior to discharge.

(ii) Discussion

Several submitters, including Dr Reed and Ms Wills, raised concerns about the Project’s impacts on bore water extraction. However, other than the Groundwater Impact Assessment, no detailed information was provided to the Panel about the number of bores in use in the area, or the possible impacts on bores.

The Groundwater Impact Assessment concludes (at section 6.2.4.1):

Groundwater users on site take water from bores for domestic and stock purposes. The reliance on groundwater at Golden Plains Wind Farm is difficult to estimate. Approximately ten bores on site are registered by Southern Rural Water as unmetered Stock and Domestic bores, however, AWE noted approximately three times this number of unregistered bores during a site visit. The number of bores infers a reliance on groundwater, however, (DSE, 2011, p. 59) records that there is no practical way to know whether a domestic and stock bore is in operation from published information. As an indication, (DELWP, 2017) reports that 14% of groundwater use is unlicensed domestic and stock/urban and 86% is licensed. The closest licence is a 20 ML/a entitlement 10 km north-west of the site (likely to be bore WRK046720) from the Upper Aquifer in the Unincorporated groundwater management unit (SRW, 2014). This implies that groundwater use is relatively small.

...

AWE observed many windmill pumps but did not observe any evidence of groundwater irrigation when on site. Many installations are abandoned, recirculating or flowing onto the ground around the bore.

The Groundwater Impact Assessment concluded (in Table 7.1) that an Environmental Management Plan will effectively respond to any final design details and ensure all groundwater risks (including to other bore users) are appropriately managed. It recommended that the Environmental Management Plan consider groundwater use patterns and droughts, and require works to be undertaken in accordance with *EPA Publication 480: Environmental Guidelines for Major Construction Sites*, State Planning and Local Planning Policy Frameworks, Regional Landcare Plans and the Catchment Salinity Management Plan.

DELWP Environment withdrew its initial recommendation for a more comprehensive groundwater impact assessment, subject to monitoring and contingency measures being included in the Environmental Management Plan. The Panel asked DELWP Environment to clarify whether suitable mitigation measures would be available should the monitoring identify a problem once the wind farm was operational. DELWP Environment responded (in Document 101) that it has “*limited expertise on salinity*” (despite it being a recommending referral authority for applications within a Salinity Management Overlay), and that possible mitigation measures could be identified in the Environmental Management Plan. This response is unhelpful.

The Groundwater Impact Assessment contains what appears to be a relatively thorough investigation of Groundwater Dependent Ecosystems, using the Bureau of Meteorology’s Groundwater Dependent Ecosystems Atlas. It considered the surveys undertaken by BL&A for habitat for species listed under the FFG Act and the EPBC Act, which determined that no habitat was present in specific areas of concern. Australian Water Environments had discussions with DELWP, the Corangamite CMA, the Council and Southern Rural Water in October 2017 specifically about risks to Groundwater Dependent Ecosystems, which did not identify any concerns. The Assessment concludes that risks to Groundwater Dependent Ecosystems are low.

Accordingly, the Panel does not consider that further investigation of groundwater impacts on biodiversity values is warranted prior to the Project being approved. The Panel supports DELWP Environment’s submission that the Environmental Management Plan should include requirements to monitor groundwater impacts on biodiversity values, and implement appropriate mitigation measures should any impacts be detected. The flora and fauna management plan conditions included in DELWP Environment’s preferred conditions (Document 96), in particular the references to ‘habitat’ rather than ‘vegetation’, are appropriate in this regard.

The Groundwater Impact Assessment and the further advice in Document 2 confirms that, although the salinity risks are low, some impacts may occur. Document 2 outlines a number of mitigation options that could be employed to manage these risks should they arise. In order to ensure that appropriate mitigation can be employed, the Panel considers it necessary to undertake further local and targeted assessments of the salinity risks of the Project once the final design is complete. Accordingly, the Panel supports the further condition recommended

by DELWP Environment requiring a salinity assessment report and management plan (Document 13).

11.5 Conclusions and recommendations

On balance, the Panel concludes that the evaluation objectives – namely to maintain the functions and values of aquatic environments and groundwater, avoid adverse effects on hydrology and protected beneficial uses and to manage potential adverse effects for the community, businesses and associated land uses – can be achieved, subject to a condition requiring a salinity assessment report and management plan being included in the permit.

Specifically, the Panel concludes:

- There is no evidence that the Project will significantly impact on surface water flow paths, flood levels or floodplain storage or downstream flood levels.
- The conditions agreed between Corangamite CMA and the Proponent (reflected in Document 14) are suitable to ensure that any surface water or flooding impacts can be avoided or managed.
- The terminal station will need to be carefully designed to ensure that contaminated runoff to the wetland and surrounding areas does not occur. Appropriate measures will need to be included in the Environmental Management Plan.
- On the basis of the available information, the use of bores for agricultural and other purposes in the area appears to be limited. There is no evidentiary basis on which to refuse or modify the Project on the grounds that it might impact bore users.
- The Environmental Management Plan for the Project should include requirements to monitor groundwater impacts on biodiversity values, and implement appropriate mitigation measures should any impacts be detected.
- There is the potential for some salinity impacts, although the risks are low. A condition should be included requiring the Proponent to prepare a salinity assessment report and management plan once detailed design is finalised, so that appropriate mitigation options can be identified and implemented (if required).

The Panel notes that a number of the turbines that may need to be removed if BL&A habitat model buffers are applied are located in the southern part of the Project site, where several of the creeks are located. Many of the areas affected by LSIOs and Salinity Management Overlays are within this part of the site. Application of BL&A habitat model buffers will therefore significantly reduce the impacts on surface water, groundwater and salinity impacts of the Project.

The Panel recommends:

Include conditions requiring:

- a) the flora and fauna management plan to address impacts on ‘habitat’ rather than ‘vegetation’; and**
- b) a salinity assessment report and management plan.**

The Panel has included suitable conditions in its recommended conditions in Appendix F.

12 Land use and socio-economic effects

12.1 Introduction

(i) EES evaluation objective

The EES scoping requirements set the following evaluation objective for 'land use and planning', and for 'social and community':

- *To manage potential adverse effects for the community, businesses and associated land uses.*

(ii) Background

Existing land uses within the site and surrounding area include mixed farming including broad acre cropping and livestock grazing. A range of non-agricultural uses occur within Rokewood, including residential, sporting, recreational and community uses. Rokewood Primary School and a child care facility are located relatively close to the site boundary.

Land use and planning impacts are discussed in Chapter 16 of the EES main report. Social impacts are discussed in Chapter 19. The EES analyses existing conditions, assesses the risks posed by the Project to existing land uses and social impacts, and outlines a range of EMMs to manage the impacts of the Project. The EMMs include:

- develop and implement an effective Community and Stakeholder Engagement Plan
- develop and implement an effective Complaint Investigation and Response Plan dealing with all aspects of construction, operation and decommissioning of the Project
- written agreements with landholders affected by access and construction activities outlining measures to minimise disruption of farming activities, and standards for post-construction rehabilitation of land
- written agreements with stakeholder landholders whose properties are required for permanent infrastructure
- undertake all quarrying activities in accordance with an approved work authority and work plan.

12.2 Evidence and submissions

The Proponent submitted that the Project will result in a direct investment of approximately \$3.5 million over the life of the Project into existing agricultural farming businesses from lease payments to 39 host landholders. In addition, the Proponent has committed to:

- a neighbour benefit scheme, that provides annual incentive payments for eligible residences located within two kilometres of a turbine
- a neighbour free power scheme, offsetting annual electricity usage for eligible residents within three kilometres of a turbine
- establishing an annual Community Benefit Fund up to \$228,000 (\$1,000 per turbine) that will finance a range of community based initiatives, scholarships, business development projects and events.

It submitted that these benefit sharing arrangements “*go far above and beyond the industry standard and planning precedent*”.

Submissions opposing the Project were concerned about the possible impact of the Project on agricultural operations. For example, the Woods were concerned that turbulence generated by the wind farm could result in spray drift of insecticides and other chemicals onto their land. They were concerned about the impact of turbulence, noise and spray drift on the bees required to pollinate their crops. Several landowners raised concerns about the impact of the turbines on aerial agricultural operations (which are discussed in Chapter 9) and GPS based autosteer cropping functions (which are discussed in Chapter 13.5).

Others were concerned that the Project would impact on the ability of local businesses to attract employees (who might prefer to work for the Project than other smaller local businesses), and local tourism activities and opportunities (including accommodation and events on local properties). Regional Victorians OTDS submitted that tourism contributes more to the Australian economy than agriculture, and that studies show that nature-based tourism (the fastest growing sector of tourism) is a particularly lucrative sector of the tourism industry. They submitted that annual surveys show that numbers of water birds in eastern Australia are declining. Wind farms contribute to this decline, further impacting on this valuable tourism opportunity.

Mr Coad raised concerns about the social and economic impacts of the Project. He submitted that 40 ongoing jobs, many of which may not go to local community members, was not enough of a benefit to outweigh the impacts on the local community. He submitted that the wind farm, while it might provide short term economic gains, would compromise long term economic and social benefits that might otherwise arise to the Shire by way of increases in agriculture and lifestyle farming which would generate and spend money locally.

Submitters raised concerns about the fairness of the compensation package being offered to neighbours, submitting that the wind farm creates divisions within the community between stakeholder and non-stakeholder landowners. Others, notably the Blakes, submitted that those taking part in the Project had chosen to do so, and those who have opted not to participate are respected and valued for their views.

Ms Wills submitted that the wind farm was likely to have a negative effect on land values of the surrounding properties, and provided a short written statement from a rural land agent in support of her submission. On the other hand, the Blakes submitted that understandable fears in the local community about impacts on land values may be unfounded, noting that the 500 kV transmission line had not resulted in any reduction in land values despite fears that it would. They submitted that local land values are more heavily impacted by proximity to the Port of Geelong, proximity to markets in Melbourne and Ballarat and the growing leisure market.

Submissions supporting the Project highlighted the significant social and economic benefits the Project would bring to the local community, including a more economically sustainable future for the host farming properties, local investment and employment opportunities and the substantial benefits available through the community benefits fund, the neighbour free power scheme and the neighbour financial incentive payment. Submissions noted that the Project would result in a substantial increase in rate revenue to Council, enabling Council to

undertake projects such as local road upgrades that would, in turn, benefit the community. Mr Peel and others highlighted the benefits to the broader community of generating clean, secure and sustainable power, addressing climate change and positioning Victoria in the national renewables market.

The Blakes own one of the host properties. They submitted that the revenue from the turbines would provide stakeholder properties like theirs with a more sustainable economic future, enabling them to put more resources into land rehabilitation and improvement practices on their farms. Examples included wetland rehabilitation and predator reduction programs, which would provide protection to breeding Brolga and other native species.

The Proponent responded to concerns about impacts on agricultural land use operations by noting that the issues and concerns raised by submitters had been thoroughly tested and addressed through the EES process, and that EMMs had been designed to address these impacts. It submitted that farming practices are generally highly compatible with wind farms, and that once the Project is operational, agricultural practices would be able to continue largely uninterrupted. It submitted that there is no evidence that agritourism is negatively affected by wind farms, and noted that wind farms can provide tourism opportunities, as had occurred with the Woakwine Range Wind Farm Tourist Drive in South Australia.

12.3 Discussion

While the Project will inevitably impact on agricultural and other surrounding land uses during the construction phase, the Panel is satisfied that those impacts are relatively minor, and that the proposed EMMs are appropriate to manage those impacts.

The Panel accepts that the Project, once operational, should have minimal impacts on agricultural land uses on the site and the surrounding area. While it acknowledges the concerns of the surrounding landowners, no evidence was presented to the Panel that suggested that those concerns are likely to be realised. A number of wind farms have been operating in agricultural areas in Victoria and other States for some years. There is no suggestion that those wind farms have impacted surrounding land uses in the ways feared by submitters. The Panel accepts that for host properties at least, the wind farm provides a source of economic stability, and a more economically sustainable future. Revenue from the turbine leases also provides host landowners with more resources to improve land use practices and programs.

The Project has the potential to deliver significant socio-economic benefits to the local community, and also to the broader Victorian community. The wind farm represents a very substantial investment of in the order of \$1.5–1.7 billion. The Project is expected to deliver approximately 770 local and regional construction jobs. The broader Victorian community will benefit from the sustainable generation of renewable electricity, the reduction in greenhouse gas emissions and the positioning of Victoria in the national renewables market.

The Panel supports the community benefits fund, the neighbour free power scheme and the neighbour financial incentive payment, but makes no comment on how they compare to other wind farm projects in Victoria as no evidence was presented to the Panel in this regard.

12.4 Conclusions

On balance, the Panel concludes that the evaluation objective – namely to manage potential adverse effects for the community, businesses and associated land uses – can be achieved.

Specifically, the Panel concludes:

- The Project will inevitably impact on agricultural and other surrounding land uses during the construction phase. However, those impacts will be relatively minor, and can be appropriately managed by the proposed EMMs, implemented through permit conditions.
- While the Panel acknowledges the concerns of local landowners, there is no evidence that the operation of the wind farm will impact on agricultural land uses on the site and the surrounding area. Impacts on aerial agricultural operations and GPS-based agricultural operations are addressed in more detail in Chapters 9 and 13.5.
- The Project has the potential to deliver significant socio-economic benefits to the local community, and also to the broader Victorian community.

13 Other issues

13.1 Community engagement and complaints handling processes

(i) EES evaluation objectives

The EES scoping requirements do not set any particular evaluation objectives for community engagement or complaints handling, although that specified for 'social and community' is relevant:

- *To manage potential adverse effects for the community, businesses and associated land uses.*

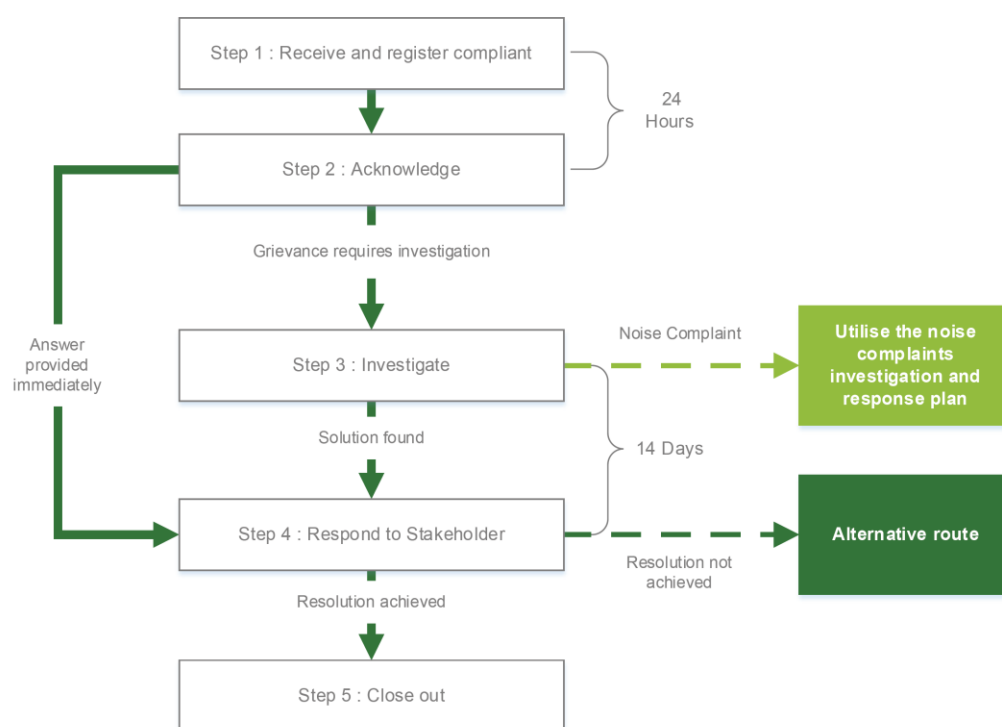
(ii) Relevant policies and standards

Section 4.3.5 of the Victorian Wind Farm Guidelines states that wind farms require complaints management processes. The model permit conditions appended to the Guidelines include conditions requiring wind farm operators to:

- prepare and implement a Complaints Investigation and Response Plan dealing with complaints relating to noise, EMI and other issues. The plan must be prepared in accordance with *Australian/New Zealand Standard AS/ANZ 10002:2014 – Guidelines for complaint management in organisations*
- publish the Complaints Investigation and Response Plan on its website, along with toll free phone numbers for complaints and queries
- prepare a Complaints Register in which all complaints and investigations are recorded
- provide a copy of the Complaints Register to the Responsible Authority annually and at other times on request.

(iii) Background

Chapter 7 of the EES main report deals with community and stakeholder engagement. It states that "*WestWind views community and stakeholder engagement as an essential element to the Project's success*". Section 7.7 outlines the community and stakeholder engagement proposed throughout the life of the Project, including a complaints and grievances process which is represented in Figure 6 below.

Figure 6 Flowchart of complaints and grievances process

Source: Figure 7.1 from the EES main report.

(iv) Evidence and submissions

Mr Dean submitted that there are no effective pathways for handling complaints about wind farms. He pointed to his personal experience of more than a decade of seeking to have his complaints about Waubra Wind Farm addressed through various government agencies, all of which had failed to resolve his concerns.

Mr Pikusa, for the Waltons, expressed concerns about community engagement once the permit issues. He submitted that there is significant scope for design changes to be approved by secondary consent, or by an amendment to the permit, without any community involvement. He submitted that some design changes could significantly impact on neighbouring landowners (for example, a decision to place turbines closer together), and queried whether it is appropriate to allow these matters to be approved without reference to the community. Mr Pikusa submitted that more detailed conditions should be included in the permit (should one issue) dealing with evaluation of and response to noise complaints.

Several submitters expressed strong views about Council's capacity to handle the future administration and enforcement of a complex set of permit conditions. They noted Council's apparent lack of critical analysis of the proposal, and the fact that it had not expressed views on critical issues such as wind farm noise, amenity impacts and siting issues. They noted Council's lack of meaningful involvement at the Hearing, and submitted that this did not bode well for Council's future handling of complaints and enforcement of the permit. Council itself conceded that it does not have the technical expertise or capacity to deal with complex technical enforcement issues such as wind farm noise compliance, and would need substantial support and assistance from the Proponent in this regard.

(v) Discussion

The draft without prejudice permit conditions tabled on the final day of the Hearing contain a number of conditions effectively requiring the Proponent to engage with the community and respond to complaints throughout the life of the Project. They require the Proponent to:

- develop and implement an effective Community and Stakeholder Engagement Plan to maintain effective and open engagement with the community through the detailed design, construction and operation phases of the Project
- publish information about impacts of the wind farm on Brolga, bats and avifauna
- publish information about the implementation and effectiveness of the Brolga compensation plan
- develop and implement a Workforce Accommodation Strategy to reduce the likelihood that existing residents in Rokewood and the surrounding area will be of displaced during construction and decommissioning
- develop and implement a Complaints Investigation and Response Plan to deal with complaints relating to all aspects of the construction and operation of the wind farm
- publish information about complaints
- keep a Complaints Register.

The conditions go above and beyond the model conditions appended to the Victorian Wind Farm Guidelines. The Panel regards them as appropriate to ensure that the Proponent continues to engage effectively with the local community and other stakeholders, and establish process to effectively and transparently manage complaints associated with the wind farm.

The Panel acknowledges the community's concerns about Council's capacity to administer and enforce the permit. Golden Plains Shire Council is a relatively small rural council with limited resources. Council is unlikely to have staff with the technical expertise to independently verify compliance with some of the more technical aspects of the permit, such as the noise conditions.

However, the permit conditions are structured in such a way that many of the more technical aspects are required to be undertaken in consultation with, or to the satisfaction of, other agencies. For example, the processes for managing impacts on native vegetation, Brolga and other fauna must be prepared and implemented in consultation with (and in some cases to the satisfaction of) DELWP Environment. Others, for example the noise conditions, require noise assessment and monitoring to be undertaken by suitably qualified acousticians and peer reviewed to the satisfaction of the Responsible Authority. These conditions go some way to alleviating the administration and enforcement pressures that might otherwise be placed on Council.

Other agencies have been established, which can supplement Council's administration and enforcement roles. For example, the National Wind Farm Commissioner is an independent role appointed by the Commonwealth Government, reporting to the Minister for the Environment and Energy. The Commissioner's role includes receiving complaints from concerned community members about wind farms, promoting best practice in the operation of wind farms, and providing greater transparency on information related to proposed and operating wind farms.

(vi) Conclusions

The Panel concludes:

- The evaluation objective – namely to manage potential adverse effects for the community, businesses and land uses – can be achieved.
- Ongoing community engagement and complaints handling processes can be suitably managed by permit conditions.
- The proposed conditions contained in the without prejudice permit conditions tabled on the final day of the Hearing (Documents 94 and 98) are appropriate.

13.2 Traffic and transport

(i) EES evaluation objectives

The EES scoping requirements set the following evaluation objectives for traffic and transport:

- *To manage potential adverse effects for the community, businesses and land uses with regard to ... traffic and transport ...*

(ii) Relevant policy and standards

Section 5.1.6 of the Victorian Wind Farm Guidelines states that construction of a wind farm and associated infrastructure (such as access roads and transmission lines) must be managed to minimise adverse impacts on nearby residents and the environment. A permit application must be accompanied by an Environmental Management Plan that sets out how impacts will be managed.

The model permit conditions appended to the Guidelines include conditions requiring wind farm operators to:

- design and locate vehicle access points to certain standards, including avoiding through traffic conflicts
- prepare an existing conditions survey of local roads and access points before construction starts
- prepare and implement a Traffic Management Plan to manage traffic impacts, including a program to inspect, maintain and repair local roads used by construction traffic
- where required, upgrade local roads to the satisfaction of the road management authority prior to construction commencing.

The Proponent will be required to comply with the requirements of the *Road Management Act 2004*, the *Road Safety Act 1986* and the *Code of Practice for Workplace Safety – Traffic Management* published under the Road Safety Act.

(iii) Background

Chapter 21 of the EES main report deals with traffic and transport impacts of the Project. A Traffic Assessment is included as Technical Appendix R to the EES main report.

Most of the traffic impacts of the Project will occur during the construction and decommissioning phases, when construction traffic is moving around the site and the local area. The Traffic Assessment identifies the main routes that will be used by construction

traffic, assesses the existing conditions, and identifies two medium rated risks that could lead to increased accidents:

- distraction and confusion of drivers using the local roads
- more heavy vehicles accessing the site, roadside hazards, variable speed limits or unfamiliar conditions.

Two EMMs are proposed to address the traffic and transport impacts of the Project:

- prepare (and then implement) a Traffic Management Plan before construction starts that (among other things):
 - identifies, assesses and appropriately reduces or eliminates road safety hazards
 - includes measures to ensure that access roads do not drop below a specified level of service
 - includes a program to inspect, maintain and (where required) repair public roads used by construction traffic, and to ensure pavement condition at the end of construction is at least as good as it was at the start of construction
- prepare and implement a Pavement Impact Assessment of public roads and access points before construction starts that:
 - assesses the suitability, design, condition and construction standard of the relevant public roads and access points
 - recommends any upgrades that may be required to accommodate construction traffic.

These EMMs are broadly consistent with the conditions contained in the model permit conditions appended to the Victorian Wind Farm Guidelines.

(iv) Evidence and submissions

Several submitters raised concerns about traffic impacts of the wind farm. For example, the Woods submitted that Wingeel Road (proposed to be one of three access roads to the Project) is a single lane road with a 15 tonne limit, in poor condition. They submitted that it is dangerous for passing in several locations, and has not been constructed for heavy vehicles or the added daily traffic likely to be created by the Project. The Woods regularly use Wingeel Road to move stock and machinery around their farm, and submitted that wind farm related traffic on Wingeel Road “*will further impede our right to farm safely in this area*”.

The Proponent did not dispute that construction traffic will impact the local road network, but submitted that the Traffic Assessment demonstrates that service levels on the surrounding road network will not reduce below an ‘A’ level of service rating. It submitted that its preferred without prejudice permit conditions (Document 94) require the Proponent to repair roads damaged by construction traffic, and to prepare and implement a Traffic Management Plan and Pavement Impact Assessment in consultation with the local councils:

Together, the Proponent’s Preferred Permit Conditions ensure that any necessary works or upgrades arising due to the Project are identified and undertaken by WestWind Energy. The consultation requirements with the two Councils and, where relevant, VicRoads will further ensure that local Councils have an integral role in ensuring traffic impacts are managed for their local communities.

(v) Discussion

The draft permit conditions tabled on the final day of the Hearing contain a number of conditions requiring the Proponent to manage the traffic impacts associated with the Project. The Proponent will be required to preparing and implement a Traffic Management Plan and Pavement Impact Assessment prior to construction commencing. These plans will require the Proponent to identify and address any anticipated traffic hazards, maintain and (where necessary) upgrade local roads, and maintain service levels on the local road network. The Traffic Management Plan will require a thorough investigation of local traffic conditions, including local bus and school bus routes. The conditions are generally consistent with the proposed EMMs, and the model permit conditions appended to the Victorian Wind Farm Guidelines. The Panel is satisfied that these conditions will enable the traffic impacts of the Project to be appropriately managed.

(vi) Conclusions

The Panel concludes:

- The evaluation objective – namely to manage potential adverse effects for the community, businesses and land uses with regard to traffic and transport – can be achieved.
- While the Project will impact on local traffic during construction and decommissioning, those impacts can be appropriately managed by the proposed EMMs, implemented through permit conditions.
- The proposed conditions contained in the without prejudice permit conditions tabled on the final day of the Hearing are appropriate.

13.3 Landfill gas

The EPA's submission to the EES (Submission 14) noted that the *Grampians Central West Waste and Resource Recovery Implementation Plan 2017* states that there is a closed landfill at Rokewood Common in Meadows Road. The landfill was operated by Golden Plains Shire Council until 2015, and information held by the EPA suggests that the landfill may have accepted municipal putrescible waste. Closed landfills, particularly those that accepted putrescible waste, can produce landfill gas for many years after closure. Buildings and structures can create pathways for landfill gas to migrate. Service trenches and the like can also provide spaces for landfill gas to collect in potentially dangerous concentrations.

(i) Relevant policy and standards

EPA Publication 1642: Assessing planning proposals within the buffer of a landfill (October 2017) provides information and advice on assessing planning permit applications for development near operating or closed landfills. EPA Publication 1642 recommends buffers between landfills and buildings and structures, to manage landfill gas. It recommends default buffers of:

- 200 metres if the landfill accepted solid inert waste
- 500 metres if the landfill accepted municipal putrescible waste.

(ii) Evidence and submissions

EPA's submission notes that the EES and Permit Application do not address the proximity of the site to the former Rokewood landfill. It recommended that Council be requested to confirm the type of waste accepted at the landfill, and where the waste was placed, to help determine the required buffer distance between the landfill and any structures associated with the wind farm.

In response to the EPA's submission, the Panel directed Council to provide the following information in relation to the Rokewood landfill:

- when it commenced operating, and when it closed
- how it was constructed (lined or unlined cells)
- what type of waste was accepted at the landfill
- what sort of site remediation measures have been undertaken since closure, and in particular whether any monitoring of potential landfill gas migration has been undertaken and what it revealed.

Council provided the following information in its submission to the Panel (Document 23):

- Council did not know when the landfill started operating, but it operated for two days per week for in excess of 20 years, closing in 2015
- the landfill was unlicensed, and waste was buried in unlined cells or trenches
- the site accepted predominantly municipal putrescible waste
- investigations in 2015 provided GPS coordinate locations identifying the boundaries where waste was buried onsite (a copy was provided)
- EPA approved a capping plan for the rehabilitation of the landfill in October 2017. To date, site remediation works have consisted of transporting soil to the site to cap the waste. No landfill gas monitoring has been undertaken and the site does not have any infrastructure in place to monitor landfill gas.

The Proponent requested ESG Environmental to assess whether trenching or other works proposed in association with the Project would create potential migration pathways for landfill gas. That assessment was provided to the Panel as Document 19.

The ESG assessment confirmed that the closest Project infrastructure to the closed landfill is proposed turbine GP087, the base of which is located approximately 600 metres from the closest closed landfill cell. The assessment states:

Given that the southern boundary of the landfill can be confirmed to be outside the 500 metre landfill buffer zone, no further landfill gas assessment of the wind farm activities will likely be required. ...

Lateral movement of gas only occurs where the landfill gas cannot freely escape and is generated at a sufficient pressure as to allow migration through the sub-soil, before venting to the surface. Landfill gas is therefore considered unlikely to be present at turbine GP087, given that it is likely that there is no engineered cap to the landfill and there is a minimum lateral migration distance of greater than 600 metre of uncapped soils. The shallow groundwater table is also likely to inhibit landfill gas migration at depth.

With regard to the risk of Project works creating potential landfill gas migration pathways to sensitive receptors such as dwellings, the ESG assessment concludes:

The only sensitive receptor currently within the 500 metre buffer zone of the landfill is the residential property located at 100 Meadows Road. At present, there is the potential for an existing landfill gas risk to this property, as it is located within the 500 metre buffer zone.

No wind farm construction or service excavation works will be undertaken between the landfill and the identified sensitive receptors located to the north west of the landfill. All wind farm construction works are located at least 600 metres south of the landfill. As such, the risk that wind farm construction activities may create a migration pathways to sensitive receptors north and west of the landfill, is considered negligible.

(iii) Discussion

The Panel appreciates the EPA having drawn this matter to the Panel's attention, and is satisfied, on the basis of the information from ESG Environmental, that the Project does not present a risk in terms of landfill gas impacts.

(iv) Conclusions

The Panel concludes:

- The Project does not present a risk in terms of landfill gas impacts from the closed Rokewood Landfill.

13.4 Shadow flicker and blade glint

Shadow flicker can result from the position of the sun in relation to the turbine blades as they rotate. Blade glint is caused by the sun reflecting on turbine blades.

(i) EES evaluation objectives

The EES scoping requirements do not specifically address shadow flicker and blade glint, but the evaluation objectives for 'landscape and visual amenity' and 'social and community' is relevant:

- *To minimise and manage potential adverse effects for the community with regard to landscape and visual amenity.*
- *To manage potential adverse effects for the community, businesses and land uses.*

(ii) Relevant policies and standards

Relevant policies and standards include:

- the decision guidelines in Clause 52.32-5 of the planning scheme, which require the Responsible Authority to consider the effect of blade glint and shadow flicker on the surrounding area
- the Victorian Wind Farm Guidelines, which state that:
 - blade glint can be minimised by finishing blades with a non-reflective treatment

- shadow flicker can be modelled in advance, and mitigated by siting and design
- shadow flicker must not exceed 30 hours per year in the area immediately surrounding dwellings and fenced garden areas
- the model conditions appended to the Guidelines, which include conditions requiring:
 - non-reflective colours and finishes to minimise visual impact
 - less than 30 hours per year of shadow flicker at any pre-existing dwelling (unless the landowner agrees otherwise).

(iii) Background

Chapter 18 of the EES main report deal with shadow flicker and blade glint. A Shadow Flicker Analysis Report prepared by GHD Australia, which includes shadow flicker modelling, is included as Technical Appendix O to the EES main report. It concluded that there is a very low risk of shadow flicker causing adverse amenity impacts.

According to the EES main report, the shadow flicker modelling in the Shadow Flicker Analysis Report was used to inform turbine siting, to ensure that dwellings will be exposed to less than 30 hours of shadow flicker per year unless the owners agree otherwise. The Shadow Flicker Analysis Report assessed 326 dwellings (50 stakeholder and 276 non-stakeholder dwellings). It found that the 30 hour per year limit would be exceeded at 26 dwellings, all of which are stakeholder properties where the owners have entered into agreements acknowledging the potential impact of shadow flicker.

The EMMs set out in the Environmental Management Framework reflect the 30 hour per year limit specified in the Victorian Wind Farm Guidelines, and require further assessment of the potential effects of shadow flicker based once the final turbine layout has been determined.

(iv) Evidence and submissions

The Proponent submitted that, subject to one error, the Shadow Flicker Analysis found that no non-stakeholder dwellings are predicted to experience more than 30 hours of shadow flicker per year. The Proponent submitted that the Project complies with the limits set by the Victorian Wind Farm Guidelines, and the Panel should regard this as addressing concerns about shadow flicker.

The error related to dwelling H32-a, just outside the northwestern boundary of the Project site. Document 15, prepared by GHD, explains that while the modelling predicted that dwelling H32-a would be exposed to more than 30 hours of shadow flicker per year, the report did not reflect this. The exceedance is addressed by moving turbine GP006 some 20 metres further away from the dwelling.

Mr Taylor submitted that the Shadow Flicker Analysis Report provided little comfort that the wind farm will not impact his property:

As a neighbouring landowner I do not know if there will be any shadow flicker on our farm or not, on our internal roads or how the households might be impacted – it's impossible to understand this report at all. We need a map that illustrates how the shadow flicker impacts us. At this stage we can't even form a view on the impact and can't accept or object to the report – because the

information supplied was insufficient. Should this very important report be peer reviewed?

The Proponent responded that Document 15 (which includes a map showing the results of the Shadow Flicker Analysis) demonstrates that no shadow flicker is predicted at the dwellings on the Taylors' property.

(v) Discussion

The without prejudice permit conditions tabled on the final day of the Hearing include conditions requiring shadow flicker at nearby dwellings to not exceed 30 hours per annum, except where the landowner agrees otherwise. An updated shadow flicker analysis must be undertaken based on the final turbine layout, to demonstrate that the Project can meet the 30 hours per annum limit.

The Panel is satisfied that these and other conditions effectively implement the EMMs relating to shadow flicker and blade glint, and appropriately address amenity impacts arising from shadow flicker and blade glint.

(vi) Conclusions

The Panel concludes:

- The evaluation objectives – namely to minimise and manage potential adverse effects for the community with regard to landscape and visual amenity, and to manage potential adverse effects for the community, businesses and land uses – can be achieved.
- The Shadow Flicker Analysis demonstrates that, with the siting changes to turbine GP006, the shadow flicker limit of 30 hours of per year will be met at all non-stakeholder dwellings.
- Impacts can be appropriately managed by the proposed EMMs, implemented through permit conditions.
- The proposed conditions contained in the without prejudice permit conditions tabled on the final day of the Hearing are appropriate.

13.5 Electromagnetic interference

(i) EES evaluation objectives

The EES scoping requirements set the following evaluation objective for EMI:

- *To manage potential adverse effects for the community, businesses and land uses with regard to ... electromagnetic interference ...*

(ii) Relevant policies and standards

The decision guidelines in Clause 52.32-5 of the planning scheme require the Responsible Authority to consider the effect of the proposal on the surrounding area in terms of (among other things) EMI.

Section 5.1.2 of the Victorian Wind Farm Guidelines deals with EMI. It notes that EMI from turbines will usually be relatively limited. It states:

The potential for electromagnetic interference from the generation of electricity from a wind energy facility should be minimised, if not eliminated, through appropriate turbine design and siting.

The siting of wind turbines in the 'line of sight' between transmitters and receivers should be avoided.

The EMMs require:

- consultation with potentially affected parties and service providers, and a mitigation strategy to be developed and implemented in as per the *Draft National Wind Farm Development Guidelines* (July 2010) to minimise or avoid interference to radio communications and telecommunications services
- a baseline survey to determine average radio and TV reception strength within 5 kilometres of the site, and a complaints handling and restoration process for impacts on radio or TV reception.

The model permit conditions appended to the Guidelines reflect the EMMs dealing with the baseline survey and complaints handling processes.

(iii) Background

Chapter 12 of the EES main report deals with EMI. An EMI Assessment prepared by DNV GL is appended as Technical Appendix H to the main report.

The EMI Assessment includes a baseline assessment of existing conditions, and an assessment of EMI risks and impacts, including cumulative impacts from the Project and the nearby Berrybank, Mt Mercer and Mt Gellibrand wind farms. The Assessment was used to develop the EMMs.

The EMI Assessment assessed the risks of EMI to telecommunications towers, fixed point-to-point microwave links, fixed point-to-multipoint licences, point-to-area licences, emergency service telecommunications, meteorological radars, trigonometrical stations, mobile phone networks, wireless internet, satellite TV/internet, radio broadcasting and terrestrial TV broadcasting. It concluded that, after mitigation measures are applied, the risks of EMI to any of these services are low (very low for trigonometrical stations).

The EMI Assessment identified the potential for some dwellings to experience reduced signal capacity for some services, including wireless internet and TV broadcasting services. Initial assessments of a medium risk were reduced to low if mitigation measures are applied.

The CFA has two point-to-point links that traverse the Project site – the Lismore to Corindhap link, and the Mount Kinross to Corindhap link. The EMI Assessment identified the potential for the Mount Kinross to Corindhap link to be impacted by three proposed turbines. According to the EES main report, the CFA understands the potential impacts but also acknowledges (and supports) the several mitigation options available to ensure disruption to this link is avoided. The Proponent has committed to working with the CFA at the appropriate time to determine and implement the correct mitigation measures.

NBN Co have suggested that satellite internet service is available if needed to mitigate any impacts to national broadband network coverage.

The EMI Assessment assessed the cumulative impacts of the Project and other surrounding wind farms. It concluded that Telstra coverage is generally good and less susceptible to cumulative impacts. However, coverage from Optus and Vodafone ranges from fair to non-existent, and these networks will be more susceptible to cumulative impacts.

(iv) Evidence and submissions

Submissions raised concerns in relation to EMI impacts on mobile phone networks, wireless internet, emergency services, GPS guidance systems used in agricultural operations and TV broadcasting services. Submitters were concerned that the wind farm could result in reduced connectivity that would impact their business operations, safety in emergency situations and general convenience. Several submitters noted that connectivity in the area is already poor, and that any reduction in connectivity due to the wind farm would be unacceptable.

Submitters noted that DNV GL had attempted to contact a number of service operators during the consultation phase of the EMI Assessment who did not respond. They were concerned that EMI impacts had therefore not been fully assessed.

At the Hearing, a number of submitters, including the Taylors, the Woods and the Waltons, highlighted the need to ensure that the wind farm does not interfere with GPS autosteer operations used on surrounding farms. Mr Taylor submitted that *“our GPS steering is the single most important efficiency and cost management tool in our farm business. This has huge impacts going forward.”* He submitted that following the construction of the Mt Mercer wind farm, they now watch satellite TV from the Northern Territory, missing out on local content. He submitted that interference with internet signals would impact their online training and education business.

Mr Taylor requested that the Proponent guarantee that neighbours of the wind farm will not be left worse off in terms of mobile phone reception, internet and GPS signal equipment, and that if they did suffer impacts, they would be adequately compensated.

The Proponent submitted that following the EMI Assessment, design modifications were made to the Project to minimise EMI impacts. Four turbines were removed and the location of other turbines was modified. Mitigation measures will also be employed to ensure the CFA’s Mount Kinross to Corindhap link remains viable.

The Proponent requested DNV GL to prepare a response to the concerns raised in submissions (Document 10). Document 10 indicates:

- DNV GL conducted further consultation with mobile phone operators Telstra, Optus and Vodafone. All providers indicated that they do not expect the Project to result in interference to their services.
- Disruption to wireless internet services is possible, but can be mitigated by offering affected residents satellite internet, which is unlikely to be affected by EMI.
- Ambulance Victoria and the CFA were both consulted for the purposes of the EMI Assessment, and both indicated that they did not expect interference to their services. Follow-up consultation with St John Ambulance and the Victoria State Emergency Service confirmed that neither operator expected interference to their services.

In relation to potential interference with GPS autosteer systems, the Proponent acknowledged that the GPS base station at Rokewood was not considered in the EMI Assessment, as it was not listed in the Australian Communications and Media Authority licence database. It submitted that DNV GL has commenced consultation with the station operator and with several suppliers of GPS systems. While consultation is not complete, the Proponent submitted that mitigation measures should be available if any impacts were to be identified (for example, moving base stations to locations which are clear of interference).

In relation to potential interference with terrestrial TV broadcasting, Document 10 notes that a number of mitigation options are available, including installing a more directional or higher gain antenna at the affected residence, relocating the antenna to a less affected position, or switching to the Australian government funded Viewer Access Satellite Television service.

(v) Discussion

The draft permit conditions tabled on the final day of the Hearing contain conditions that are consistent with the model conditions dealing with interference to radio and TV reception. These conditions address and implement EMMs EM011 and 012.

Those conditions do not extend to other services that could be potentially impacted by EMI, such as GPS guidance systems, wireless internet and emergency services communications. The Panel is satisfied on the basis of the EMI Assessment and Document 10 that mitigation measures are available should these services be impacted. Suitable permit conditions should be included requiring mitigation measures to be impacted (if required).

The Panel is satisfied that the EMMs dealing with consultation and mitigation strategies have been effectively implemented through the EMI Assessment and the follow-up work undertaken by DNV GL.

(vi) Conclusions and recommendations

The Panel concludes:

- The evaluation objective – namely to manage potential adverse effects for the community, businesses and land uses with regard to EMI – can be achieved, subject to further conditions being included in the permit.
- Many of the services that could be impacted by EMI are essential for safety, effective operation of the surrounding businesses, and the convenience of nearby residents.
- Although the EMI Assessment indicates that EMI risks are low, impacts could still be experienced.
- The Panel is satisfied that mitigation measures are available to reduce or avoid these impacts.
- Appropriate permit conditions should be included to address impacts to services other than TV and radio broadcasts.

The Panel recommends:

Include conditions requiring electromagnetic interference to services other than radio and television signals to be addressed.

The Panel has included suitable conditions in its recommended conditions in Appendix F.

13.6 Health effects

(i) EES evaluation objectives

The EES scoping requirements do not set any particular evaluation objectives for health effects, although that specified for 'social and community' is relevant:

- *To manage potential adverse effects for the community, businesses and associated land uses.*

(ii) Relevant policies and standards

Neither Clause 52.32 of the planning scheme nor the Victorian Wind Farm Guidelines specifically address health impacts. The New Zealand Standard refers to health and amenity in the context of noise limits. It states:

The consensus view of the committee, including numerous experienced acoustic experts, is that the Standard provides a reasonable way of protecting health and amenity at nearby noise sensitive locations, without unreasonably restricting the development of wind farms.

(iii) Evidence and submissions

Several submissions raised concerns about alleged adverse health impacts of the Project and wind farms in general. Mr Dean submitted that he and his family had suffered serious health implications as a result of noise emissions from the Waubra wind farm. Dr Reed submitted that as a practicing GP, he was sincerely concerned about sleep deprivation, depression, and other health impacts of wind farms on people living in local communities. He cited research published in the British Medical Journal that suggested that:

A large body of evidence now exists to suggest that wind turbines disturb sleep and impair health at distances and external noise levels that are permitted in most jurisdictions, including the United Kingdom. Sleep disturbance maybe a particular problem in children, and it may have important health implications for public health.

Other submitters were concerned that the health implications of infrasound from wind farms was not well understood, and submitted that caution should be exercised.

Dr Thorne gave evidence for the Waltons in relation to wind farm noise. His evidence was that turbine noise can lead directly to annoyance and sleep disturbance. Health effects include *"immediate reductions in general well-being, with stress-related disease emerging from chronic annoyance and sleep disturbance"*. He cited the December 2017 decision of the Commonwealth Administrative Appeals Tribunal decision in *Waubra Foundation v Australian Charities and Not-for-profits Commission*, in which he gave evidence on behalf of the Waubra Foundation.

The Proponent responded that *"to date, no evidence or submissions that wind farms cause adverse health impacts have been accepted by the Victorian government, Planning Panels Victoria, EES Inquiry Panels or VCAT"*. It referred the Panel to the National Health and Medical Research Council (NHMRC) publication *NHMRC Statement: Evidence on Wind Farms and Human Health* (Australian Government, February 2015), which states:

There is no direct evidence that exposure to wind farm noise affects physical or mental health. While exposure to environmental noise is associated with health effects, these effects occur at much higher levels of noise than are likely to be perceived by people living in close proximity to wind farms in Australia. The parallel evidence assessed suggests that there are unlikely to be any significant effects on physical or mental health at distances greater than 1,500 metres from wind farms.

There is consistent but poor quality direct evidence that wind farm noise is associated with annoyance. While the parallel evidence suggests that prolonged noise-related annoyance may result in stress, which may be a risk factor for cardiovascular disease, annoyance was not consistently defined in the studies and a range of other factors are possible explanations for the association observed.

There is less consistent, poor quality direct evidence of an association between sleep disturbance and wind farm noise. However, sleep disturbance was not objectively measured in the studies and a range of other factors are possible explanations for the association observed. While chronic sleep disturbance is known to affect health, the parallel evidence suggests that wind farm noise is unlikely to disturb sleep at distances of more than 1,500 metre from wind farms.

The Proponent submitted that it was of some concern that Dr Thorne's evidence "completely ignored" the NHMRC findings quoted above, as well as the Department of Health's assessment of wind farm health effects, submitting that this "taints his evidence as being selective and partial".

There was some debate in submissions and evidence as to what conclusions the Panel should draw from the more recent decision of the Commonwealth Administrative Appeals Tribunal in *Waubra Foundation v ACNC*. The passages from the decision quoted in Dr Thorne's evidence appear to support the conclusion that noise annoyance from wind turbines is a plausible pathway to disease. The Proponent responded that Dr Thorne had selectively cited parts of the Tribunal's findings, and had excluded parts that state:

The proposition that sound emissions from wind farms directly cause any adverse health effects which could be regarded as "disease" for the purposes of the ACNC Act is not established.

and

(b) Nor, on the current evidence, is there any plausible basis for concluding that wind farm emissions may directly cause any disease.

(iv) Discussion

On balance the Panel places greater weight on the latest publication from the NHMRC than it does on the decision in *Waubra Foundation v ACNC*. The NHMRC publication is based on scientific research, and represents the best available information. The Panel does not consider it appropriate to set this publication aside, or to reduce its weight, on the basis of arguably selectively quoted findings of a Tribunal which was concerned with the Waubra Foundation's

registration as a charity rather than a forensic analysis of whether wind farms produce health effects.

The *Cherry Tree* decision concluded that while it is likely a small proportion of the population around a wind farm do suffer health effects, the current state of scientific opinion is that there is no physiological causal link between these effects and wind turbines. It concluded that even if health effects on a small proportion of the community could be established, this would not necessarily be sufficient to refuse a wind farm application, given the strong planning policy support for wind farms.

The Commonwealth Government has established an Independent Scientific Committee whose terms of reference include monitoring and periodically reviewing progress in understanding the potential health impacts of wind farms, and commenting on further possible research developments to support standards and measurement protocols to further consider the health issues. The Panel notes, but does not rely upon, the Committee's latest annual report (dated April 2018), which indicates that the Committee "*has been drafting a document reviewing the potential health impacts of wind turbine noise*". The Committee's report reaches no conclusions as to the health impacts of wind farm noise.

(v) Conclusions

The Panel concludes:

- The evaluation objective – namely to manage potential adverse effects for the community, businesses and associated land uses – can be achieved.
- There is no evidentiary basis on which to refuse or modify the Project on health grounds.

13.7 Fire fighting

(i) EES evaluation objectives

The EES scoping requirements do not set any particular evaluation objectives for fire fighting, although that specified for 'social and community' is relevant:

- *To manage potential adverse effects for the community, businesses and associated land uses.*

(ii) Relevant policies and standards

The objective of Clause 13.02-1S (Bushfire) of the Planning Policy Framework is to strengthen the resilience of settlements and communities through risk-based planning that prioritises the protection of human life. The policy applies to all planning and decision making for land that is within a designated bushfire prone area, subject to a Bushfire Management Overlay, or proposed to be used or developed in a way that may create a bushfire hazard. Clause 71.02-3 of the planning scheme states that in bushfire affected areas, planning and responsible authorities must prioritise the protection of human life over all other policy considerations.

(iii) Background

DELWP Planning directed the Proponent to give notice of the Permit Application to the CFA. The CFA did not object to the grant of a permit, but its initial response was that passing bays

should be required every 200 metres on access tracks within the site, consistent with the CFA's *Emergency Management Guideline for Wind Energy Facilities*, August 2017. After subsequent discussions with the Proponent, the CFA indicated that it was willing to review this requirement, but recommended that the Proponent develop an emergency management plan to deal with fire risk. Document 12 sets out the CFA's detailed recommendations with regard to the emergency management plan.

(iv) Evidence and submissions

Some submitters raised concerns that the wind farm would heighten bushfire risk in the surrounding area. For example, Ms Wills submitted that the wind farm could compromise both aerial and ground-based fire fighting operations. She pointed the Panel to the significant efforts required to extinguish the Dereel fire some years ago before it got to the Mt Mercer wind farm (then under construction). She submitted that changing weather conditions are resulting in more severe fire danger days, and that a fire could be devastating on the surrounding farms and townships if fire fighting efforts were compromised by the presence of the wind farm.

Relying on evidence from Mr Jennings, the Proponent submitted that ground-based fire fighting operations are enhanced by wind farms due to increased accessibility created by internal roads. It pointed the Panel to the CFA's updated response to the Permit Application (Document 12), and tabled an undated document that appears to have been signed by the Captain of the Mt Mercer Fire Brigade (Document 89) that states that during the Dereel fire, the Mt Mercer wind farm directed personnel and dozers to assist the local brigade to develop control lines. Document 89 also states that wind farm tracks create cleared fire breaks and easy access across farms for vehicles.

(v) Discussion

The without prejudice permit conditions tabled on the final day of the Hearing include a condition requiring the preparation of an Emergency Response Plan in consultation with the CFA and Rural Ambulance Victoria. The plan must:

- outline measures to provide for adequate fire-fighting access within the wind farm, including ground-based and aerial fire-fighting operations
- be generally in accordance with the CFA's *Emergency Management Guidelines for Wind Farms*, save for the requirement for passing bays on access tracks.

The Panel is satisfied that these conditions appropriately address fire-fighting risks, and encourages the Proponent to have regard to the detail in Document 12 when preparing the Emergency Response Plan.

(vi) Conclusions

The Panel concludes:

- The evaluation objective – namely to manage potential adverse effects for the community, businesses and associated land uses – can be achieved.
- Fire-fighting risks can be appropriately managed through the proposed permit conditions requiring an Emergency Response Plan to be prepared in consultation with the CFA and Rural Ambulance Victoria.

13.8 Heritage

(i) EES evaluation objectives

The EES scoping requirements set the following evaluation objectives:

- *To avoid or minimise adverse effects on Aboriginal cultural heritage values.*
- *To avoid or minimise adverse effects on historic cultural heritage.*

(ii) Relevant policies and standards

Relevant policies and standards include:

- The *Aboriginal Heritage Act 2006*, which requires a CHMP to be prepared for any project that is the subject of an EES. The CHMP must be approved prior to any statutory approvals being issued.
- Clause 15.03 (Heritage) of the Planning Policy Framework, which seeks to ensure the conservation of places of heritage significance and to protect and conserve places of Aboriginal cultural heritage significance.
- Clause 52.33 (Post boxes and dry stone walls) of the planning scheme, which requires a planning permit to demolish, remove or alter a dry stone wall constructed before 1940, unless the works are required to install a gate.

(iii) Background

The western part of the Project site falls within the Wathaurung Aboriginal Corporation Registered Aboriginal Party area. The eastern part falls within the Eastern Maar Registered Aboriginal Party application area and the Guligad Aboriginal Corporation Traditional Owner Area.

Chapter 8 of the EES main report deals with Aboriginal cultural heritage. Chapter 8 states that two CHMPs have been prepared for the Project, one for the Project site and one for the quarry site. The CHMP for the Project site confirms that the majority of Aboriginal cultural material is located on rocky rises, ridgelines and in proximity to water sources. Approximately 2,200 stone artefacts were identified across 32 Aboriginal Places and several Low Density Artefact Distributions which have been submitted for registration on the Victorian Aboriginal Heritage Register. The CHMP for the quarry is currently being developed. Preliminary results indicate that artefacts have been identified within the quarry site.

Chapter 8 states that while significant efforts have been made to avoid artefacts and locations of significance, it is likely that some will be impacted. The EMMs include the requirement that all development be undertaken in accordance with an approved CHMP. Additional management conditions have been developed in conjunction with the Registered Aboriginal Parties, which include relocating some infrastructure to avoid or minimise impacts on Aboriginal Places and artefacts.

There are a number of historic properties in the area surrounding the site, including Warrambeen, Glenfine and Naringal. Glenfine and Naringal are listed by the National Trust, and subject to a Heritage Overlay under the Planning Scheme (HO4 and HO169 respectively). Glenfine is also listed on the Victorian Heritage Register. Warrambeen is listed as an 'Indicative Property' on the Australian Heritage Database (which means that a formal nomination has not been made and the Commonwealth Department of Environment and Energy has not prepared all the data necessary for a nomination).

Chapter 14 of the EES main report deals with historic cultural heritage. It references the desktop study undertaken to identify known places of historic interest that might be impacted by the Project (Technical Appendix K to the EES), which found only two listed archaeological sites within the Project site (McMillan's Bridge and the Queen of the Plains Co. mining site), neither of which will be directly impacted. It concludes that the key issue is the potential for unknown historic heritage to be discovered within the Project footprint during construction. Section 14.6.1 states that unexpected finds will be dealt with in accordance with an unexpected heritage finds protocol.

(iv) Evidence and submissions

The Proponent submitted that the potential disturbance or destruction of Aboriginal cultural heritage on the quarry site *"is no small matter but context is important"*. It submitted that the CHMP will need to be approved by the Wathaurung Registered Aboriginal Party before the quarry can proceed. If the CHMP is approved, artefacts and other cultural material can be salvaged and safely removed, providing an opportunity to assemble very rare and important information about the use of this location by its traditional custodians. It submitted that the quarry is a very important aspect of the Project, in that it will significantly reduce the number of construction vehicles on public roads.

Several submissions raised concerns about the impact of the Project on historic cultural heritage, in particular the homesteads in the area, the cobbled laneway known as Ledwells Lane and dry stone walls. For example, Mr Taylor submitted that the historic buildings on Warrambeen, built between 1860 and 1870, would be significantly impacted by the wind farm, which would be the single largest change to the landscape in the history of the property. Others, for example the Blakes, submitted that the landscape has been in constant change since European settlement, and that change is inevitable and not necessarily negative.

The Proponent submitted that there is no heritage-related basis for refusing the Permit Application. While the landscape and visual impacts on the homesteads are a legitimate consideration, there is no statutory or policy basis to assert that the views from those homesteads have greater weight or value than views from other dwellings. It submitted that introducing another change to the landscape that has already been altered since the homesteads were constructed will not derogate from the intrinsic historical or architectural merit of the homesteads. It submitted that Heritage Victoria has determined that Ledwells Lane has not been included on the Victorian Heritage Inventory, because it fails to meet relevant thresholds (confirmed in Document 17). While some of the dry stone walls will need minor modifications to facilitate vehicular access and underground cabling, extensive dry stone walls will remain in place, and the ESS contemplates reconstruction of the dry stone walls under supervision of a qualified stonemason.

(v) Discussion

The Panel accepts that siting and design modifications have been made to avoid impacts on Aboriginal Places, in consultation with the Wathaurung Registered Aboriginal Party. The Panel supports the relocation of a grid connection powerline around, rather than through, Baths Swamp (as depicted in Document 3), which the Proponent is proposing following consultation with Aboriginal Affairs Victoria and the Wathaurung Aboriginal Corporation.

While some impacts on Aboriginal cultural heritage will occur, the Panel considers that approved CHMPs are an appropriate means of managing these impacts. The CHMPs must be approved prior to any statutory approvals being issued, or works for the Project or the quarry proceeding.

With regard to historic cultural heritage, the Panel does not consider that the visual impacts of the Project on the homesteads are a justification for the Project not to proceed. Naringal and Glenfine are located some distance from the Project, and the Glenfine homestead is protected from visual impacts to some degree by the topography of the land. While Warramben will be impacted to a greater degree, screening is provided by existing vegetation on the site.

The Panel is satisfied that unexpected places or objects of historic cultural heritage significance that may be discovered during construction can be dealt with in accordance with an unexpected heritage finds protocol, as contemplated by the EMMs and the draft without prejudice permit conditions.

While the ESS contemplates reconstruction of the dry stone walls under supervision of a qualified stonemason (at pages 14-1 and 14-6), this requirement is not reflected in the EMMs. This should form part of the Construction Environment Management Plan, and the Panel has included appropriate conditions in Appendix F.

(vi) Conclusions and recommendations

The Panel concludes:

- On balance, the evaluation objectives – namely to avoid or minimise adverse effects on Aboriginal cultural heritage values and historic cultural heritage – can be achieved, subject to further conditions being included in the permit.
- While the Project has been designed to minimise impacts on Aboriginal cultural heritage and historic cultural heritage, impacts cannot practicably be avoided.
- Approved CHMPs are the appropriate mechanism for managing impacts on Aboriginal cultural heritage.
- The Panel supports the relocation of the proposed grid connection powerline around, rather than through, Baths Swamp as depicted in Document 3.
- Impacts on historic cultural heritage, including the historic homesteads in the surrounding area, are not so significant as to justify refusing or modifying the Project.
- An additional permit condition should be included that requires dry stone walls impacted by the construction of the Project to be reconstructed under the supervision of a suitably qualified stonemason.

The Panel recommends:

Include conditions on the permit requiring:

- a) the relocation of the proposed grid connection powerline around, rather than through, Baths Swamp as depicted in Document 3**
- b) dry stone walls impacted by the construction of the Project to be reconstructed under the supervision of a suitably qualified stonemason.**

The Panel has included suitable conditions in Appendix F.

14 Integrated assessment

14.1 Net community benefit and sustainable development

(i) Relevant policies and standards

As noted in Chapter 3.3, Clause 71.02-3 (Integrated decision making) of the planning scheme requires planning decision making to integrate the range of relevant planning policies and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations. This is known as the 'net community benefit' test.

(ii) Background

Chapter 2 of the EES main report sets out the Project's rationale and benefits. They include addressing climate change impacts, contributing to the Commonwealth Government's Paris Agreement commitments, contributing to establishing Victoria as a renewable energy leader, assisting to transition the Australian economy to one based on renewable energy generation and contributing to energy supply and security, in addition to a range of more localised benefits.

(iii) Submissions

The Proponent submitted that the Project will have state-significant social, economic and environmental benefits by delivering up to 1,000 MW of renewable energy. It acknowledged that these benefits must be weighed against impacts on the community and environment, and submitted that:

... given the powerful statements of planning policy support for renewable energy development and wind energy facilities in the Planning Scheme, a localised impact would need to be profoundly adverse or non-compliant with performance criteria in the Victorian Wind Farm Guidelines to support a view that the Project did not display a net community benefit. WestWind Energy will further submit that not only is there no evidence to support a view that there will be such impacts, but there will be many economic and social benefits for the local community.

Mr Coad submitted that the economic case has not been made for the proposal. He and Mr Cumming submitted that the efficiency of the wind farm had not been established, leaving the Panel and the wider community with limited context in which to assess the net community benefit of the proposal in terms of its generation capacity, or its ability to contribute to sustainability objectives including a reduction in greenhouse gas emissions.

Mr Coad submitted that although climate change is clearly a significant issue, leading to dry and eroding soils and a reduction in the amount of viable farmland in Australia and elsewhere in the world, the contribution of wind energy in reducing these impacts is uncertain. He submitted that proven technologies such as nuclear and rooftop solar should be relied on to contribute meaningfully to a reduction in greenhouse gas emissions, as well as further investigation into emerging technologies such as soil carbonisation.

The Proponent submitted that the Panel should weigh the Project's impacts on Brolga (discussed in detail in Chapter 4) in the context of a net community benefit analysis. It submitted:

In order to evaluate the net community benefit of the Project based on the Supreme Court's guidelines in Rozen, the Panel needs to consider whether the cost of removing turbines to increase the size of turbine-free buffers around breeding wetlands is consistent with Commonwealth and, especially, Victorian government policy that encourages significant investment in renewable energy development.

It submitted that measures to reduce or avoid impacts on Brolga must be "reasonably and proportionally weighed against the costs of such measures". It invited the Panel to compare the Project (for which the collision risk is estimated to be 0.42 birds per annum¹) to the Dundonnell wind farm:

Dundonnell wind farm has a considerably smaller rated generation capacity (312 MW) but a greater predicted impact on Brolga (0.95 birds per annum) than this Project, yet it would not have been approved unless it exhibited a net community benefit. It must therefore follow that this Project also has a net community benefit, because it generates much more renewable energy with fewer impacts to Brolga.

(iv) Discussion

The Supreme Court described an acceptable planning outcome in *Rozen and Anor v Macedon Ranges Shire Council and Anor* (2010) 181 LGERA 370 at pages 408 to 409:

The test of acceptable outcomes stated in [Clause 65 of the Planning Scheme] is informed by the notions of net community benefit and sustainable development. An outcome may be acceptable despite some negative characteristics. An outcome may be acceptable because on balance it results in net community benefit despite achieving some only of potentially relevant planning objectives and impeding or running contrary to the achievement of others.

Balancing the impacts of the wind farm against the consequences of Project modifications to reduce those impacts is no easy exercise. The response to impacts should be reasonable and proportionate. The Panel does not consider that this exercise is as simple as saying that an outcome found to be acceptable at Dundonnell should be regarded as acceptable here. Instead, the impacts of each proposal must be assessed against the applicable policy context, and the various factors that decision makers are required to take into account.

The Panel's findings and conclusions in relation to the impacts of the Project are explained in the preceding chapters. Many of the impacts are likely to be more significant during the construction phase, and most can be managed through appropriate permit conditions. The Panel has recommended various changes to proposed permit conditions, and some additional permit conditions, to further reduce the Project's impacts.

¹ Table 1 in the updated Symbolix collision risk modelling, Appendix 5 to Brett Lane's Expert Witness Statement.

Some of the Project's impacts are significant, and cannot be reduced through permit conditions. Visual and landscape impacts are an example. This, however, must be balanced against the fact that the landscape, while attractive and deeply valued by those who live in it, is not afforded special protection in the Planning Scheme.

The adverse impacts of the Project must be balanced against the benefits that the Project offers. The Panel finds in Chapter 12 that the Project will make a significant social and economic contribution to the local and regional economy. In terms of broader benefits, the Project – even with the BL&A habitat model buffers – will make a significant contribution toward achieving government emissions reduction targets and renewable energy targets. It will fulfil a vital role in reducing greenhouse gas emissions, and transitioning the Victorian economy toward net zero emissions.

The Proponent urged the Panel to weigh the Project's impacts on Brolga in the context of a net community benefit analysis. This requires the benefits of the Project to be balanced against the impacts on Brolga. Equally, the gains to Brolga of alternative buffers must be balanced against the loss of renewable energy generation and other benefits of the Project that flow from reducing the number of turbines.

In order to balance these competing interests responsibly, and to determine which outcome results in the greater community benefit, the Panel must have a clear understanding of the consequences of prioritising one interest over another.

The consequences of BL&A habitat model buffers in terms of renewable energy generation are relatively clear. BL&A habitat model buffers will result in the loss of 47 turbines, or 245MW of renewable energy generation capacity, when compared with the Proponent's proposed layout.

What is less clear is the impact on Brolga. The Proponent is effectively asking the Panel to rely on predictions of collision risk modelling in assessing impacts on Brolga, as it has not provided empirical site-specific data. The collision risk modelling involves significant uncertainty. That uncertainty feeds into uncertainty in the outcomes of the PVA analysis, as the modelling is a key input into the PVA analysis.

The Brolga Guidelines deal with uncertainty by adopting a precautionary approach of applying 3.2 kilometre buffers unless it can be shown with a high level of confidence that the size and shape of home ranges on the project site justify smaller buffers. The Proponent has not been able to demonstrate that the home ranges on the Project site are smaller than the default home ranges contemplated under the Guidelines. Accordingly, the Panel does not consider that a reduction in the buffers is justified, or would result in a net community benefit.

The value of the Guidelines would be significantly undermined if the Panel were to support the Proponent's reduced buffers in the absence of a high level of confidence that reduced buffers were appropriate. Not only would this potentially result in a bad outcome for Brolga in this particular case, it would set a dangerous precedent for future wind farm proposals. The Panel does not consider that such an approach would deliver a net community benefit, or a sustainable development outcome that it is in the interests of present and future Victorians.

Therefore, applying a net community benefit analysis, the Panel is satisfied that the BL&A habitat model buffers are appropriate.

(v) Conclusions and recommendations

Overall, the Panel is satisfied that the wind farm, when constructed, will result in a net community benefit, and will make a significant contribution to sustainable development, subject to the recommendations in this Report, including applying turbine free buffers based on the BL&A habitat model.

The Panel recommends:

The environmental effects of the Golden Plains Wind Farm project can be managed to an acceptable level and the relevant project approvals should be granted, subject to the recommendations in this Report.

14.2 Environmental Management Framework

The EES scoping requirements include the following:

- *The Environmental Management Framework provided in the EES should provide a transparent framework with clear accountabilities for managing and monitoring environmental effects and hazards associated with construction and operational phases.*

The Panel has reviewed the Environment Management Framework, and subject to some specific considerations in the issues chapters above, considers that it provides, in conjunction with planning permit conditions, a sound framework for managing environmental impacts to an acceptable level.

The Environment Management Framework contains EMMs which are designed to manage the environmental effects and impacts of the Project. These are largely intended to be implemented through conditions on the planning permit. The Panel has assessed the proposed EMMs and whether they are effectively implemented through permit conditions in each issue specific chapter of this Report. Where necessary, the Panel has recommended changes to, or additional, permit conditions to ensure that the EMMs are properly implemented in a statutory sense.

Some EMMs are not intended to be implemented through planning permit conditions. The Panel is satisfied that there are alternative ways in which these EMMs can be effectively implemented, as set out in Table 10.

Table 10: Recommendations for implementation of remaining EMMs

EMMs	Requirement	Recommendations for implementation
AQ002, LU003, NV004 and SC003	All quarry operations to be undertaken, and the quarry to be rehabilitated, in accordance with an approved work authority and work plan	This will be dealt with through the statutory approval process under the MRSD Act. ERR should have regard to the specific requirements of the listed EMMs when assessing the work authority and work plan for the quarry, to ensure that the conditions reflect the EMMs.
BD002 and 006	Offset Strategy to be approved and implemented to offset impacts on MNES	This will be dealt with through the statutory approval process under the EPBC Act. The Commonwealth Minister for the Environment should have regard to the

EMMs	Requirement	Recommendations for implementation
		requirements of BD002 and 006 when considering whether (and on what terms) to approve the Project as a controlled action under the EPBC Act.
BD003, 005 and 007	Permits to be obtained under the FFG Act to remove listed communities and species from public land	This will be dealt with through the statutory approval process under the FFG Act.
BD009	Works on a waterway to be undertaken in accordance with the necessary permits under the <i>Water Act 1989</i>	This will be dealt with through the statutory approval process under the <i>Water Act 1989</i> .
HA all	All development to be in accordance with an approved CHMP	This will be dealt with through the statutory approval process under the <i>Aboriginal Heritage Act 2006</i> .
LU002, 004-10	Agreements to be entered into with affected landowners regarding construction impacts and rehabilitation on completion of construction	Proponent has advised that agreements are already in place. As these are non-statutory requirements, they do not need to be implemented via conditions on statutory approvals.
SC002	Implementation of the proposed Community Benefit Fund, Electricity Offset and Energy Audit Benefit Scheme, and Annual Financial Incentive Program for Neighbours	Proponent has committed to implementing these schemes. As these are non-statutory requirements, they do not need to be implemented via conditions on statutory approvals.
SW002, 005, 007 and 008	Requirements that works on waterways be undertaken in accordance with permits issued under the <i>Water Act 1989</i> , and requirements in relation to structures constructed within flood affected areas	These will be dealt with through the statutory approval and consent process under the <i>Water Act 1989</i> . Corangamite CMA should have regard to the listed EMMs when issuing permits or consents under the Water Act.

The Panel notes that the EES scoping requirements call for transparency in the Environmental Management Framework. To this end, the Panel has included conditions in its recommended permit conditions requiring the endorsed versions of various plans required under the permit to be made available on the project website.

14.3 Permit application

(i) Relevant policies and standards

Section 5 of the Victorian Wind Farm Guidelines sets out the matters that must be considered when assessing an application for a wind farm permit. They include:

- the contribution of the proposal to government policy objectives

- impacts on the amenity of the surrounding area, including through noise, blade glint, shadow flicker and EMI
- impacts on landscape and visual amenity
- impacts on flora and fauna
- impacts on aircraft safety
- impacts of construction and decommissioning activities.

Other relevant considerations (which are outlined in more detail in Chapter 3) include:

- the matters a Responsible Authority is required to take into account in assessing a permit application, including the Victorian planning objectives and the economic, social and environmental impacts of the proposed use and development
- the various sometimes competing objectives and strategies set out in the integrated Planning Policy Framework and the Local Planning Policy Framework
- the matters set out in Clause 65.01 of the planning scheme, including the purpose of the Farming Zone and applicable overlays, the effect on the amenity of the area, salinity issues, water quality issues, the extent and character of native vegetation impacted, and the degree of flood or fire hazard
- adopted government policy in relation to climate change and renewable energy
- the requirement in the Climate Change Act for the Victorian Government to ensure that its decisions appropriately take climate change into account.

(ii) Discussion

DELWP Planning's Part A submission provided a helpful summary of the permit triggers, application requirements and referral requirements for the Project under the planning scheme. It also provided a summary of referral authority comments and responses, and a chronology of the Permit Application. The Panel has been assisted by these in its deliberations.

The impacts required to be considered in the decision guidelines have been discussed at length in the chapters in Part B of this Report. In essence the Panel considers:

- The wind farm will have limited adverse effect on agricultural land use, and will provide a more economically sustainable basis for host farms to operate.
- Impacts on the land, including surface water and groundwater, can be effectively managed through good project design, development and operation, including a Construction Environmental Management Plan that includes a Sediment Erosion and Water Quality Management Plan, a Hazardous Substances Management Plan and a salinity assessment report and management plan.
- The impact on the landscape will be significant, but the landscape is not identified or protected in the planning scheme as having particular significance.
- Impacts on Brolga can be managed to an acceptable level by providing increased turbine free buffers based on the BL&A habitat model polygons, and a Brolga Compensation Plan.
- Impacts on native vegetation and biodiversity other than Brolga can be managed to an acceptable level through a Flora and Fauna Management Plan, a BAM Plan and a Native Vegetation Management Plan.

- Technical aspects of the wind farm such as noise have been largely addressed, although some further assessment will be required following the grant of a permit, and once the wind farm is operating.
- Impacts of the temporary quarry (and of the temporary concrete batching plants) can be adequately managed through a CHMP, a quarry Work Plan approved by ERR, an Air Quality Management Plan and a Blasting Plan.

(iii) Conclusion and recommendation

On balance, the Panel considers that given the impacts of the Project can largely be managed to an acceptable level, and given the strong policy support in the planning scheme and other adopted government policy for renewable energy projects, a permit should be granted.

Consistent with the conclusions on environmental effects, the Panel recommends:

Issue planning permit PA170266 for the Golden Plains wind energy facility subject to the permit conditions contained in Appendix F.

PART C: COMMONWEALTH MATTERS

15 Matters of National Environmental Significance

15.1 Introduction

(i) EES evaluation objective

The EES scoping requirements set the following evaluation objective:

- *To avoid, minimise or offset adverse effects on native vegetation, habitat, listed threatened species and ecological communities, migratory species and other protected flora and fauna.*

(ii) Background

Wind farm

The assessment of the impact of the Project on MNES is contained in Chapter 12 of the Biodiversity Assessment prepared by BL&A (Technical Appendix E to the EES main report). The assessment examined MNES that have the potential or are likely to occur within 10 kilometres of the site. A summary of the assessment is presented in the following tables (some of this information is a repeat of information contained in Table 6 in Chapter 5).

Table 11: MNES – Ramsar wetlands

MNES	Assessment
Ramsar wetlands that form Western District Lakes occur within 50 kilometres of the wind farm site.	No significant impacts are expected on these wetlands due to the distance from the proposed wind farm site.

Table 12: MNES – flora

MNES	Assessment
Small Golden Moths	Not recorded during surveys. No significant impacts.
Trailing Hop Bush	Recorded during surveys along roadsides. Roadsides with species present have been avoided. No significant Impacts.
Spiny Rice-flower	Recorded on roadsides and private land. Roadsides and private land with species present have been avoided. No significant impacts.
Fragrant Leek-orchid	Not recorded during surveys. No significant impacts.
Button Wrinklewort	Not recorded during surveys. No significant impacts.
Large-headed Fireweed	Not recorded during surveys. No significant impacts.
Swamp Fireweed	Not recorded during surveys. No significant impacts.
Swamp Everlasting	Not recorded during surveys. No significant impacts.
Clover Glycine	Not recorded during surveys. No significant impacts.
White Sunray	Not recorded during surveys. No significant impacts.

Table 13: MNES – fauna

MNES	Assessment
Gull-billed Tern	Not recorded during surveys. Potential to occur. Unlikely to occur in significant numbers and habitat has been avoided. The Project is unlikely to have a significant impact.
Latham's Snipe	Limited extent and quality of wetland habitat and lack of observations make it unlikely that an important population resides on the Project site. The Project is unlikely to have a significant impact.
Fork-tailed swift	Species is abundant and widespread with population numbers as high as 100,000. Significant impacts on this species from collision with wind turbines are unlikely to occur.
Swift Parrot	Not recorded during surveys. Unlikely to occur in significant numbers and habitat has been avoided. No significant impacts.
White-throated Needletail	The Project site is unlikely to represent important habitat. While the species has been recorded colliding with operating wind farms, the numbers involved are unlikely to represent a significant impact on the population, which numbers in the tens of thousands.
Plains Wanderer	Last recorded within ten kilometres of the wind farm in 1992. The species is unlikely to occur regularly at the wind farm site but may occur sporadically. Impacts on this species are considered negligible.
Growling Grass Frog	Recorded from two of the higher quality wetlands in the Project site. Targeted surveys not necessary as the wetlands will not be impacted and no wind farm infrastructure will be located within 100 metres of confirmed Growling Grass Frog wetland sites. Impacts unlikely.
Yarra Pygmy Perch	Historically recorded as present in two waterways that traverse the Project site. Likely to occur. Impacts will not be significant as no project infrastructure other than overhead power lines crosses the two waterways, and turbines are located a minimum of 100 metres from waterways.
Striped Legless Lizard	Recorded on the wind farm site. Removal of up to 44.1 hectares of potential habitat. Significant impact. Removal of habitat subject to development of acceptable management arrangements and a suitable offset.
Golden Sun Moth	Recorded on the wind farm site. Removal of up to 44.1 hectares of potential habitat. Significant impact. Removal of habitat subject to development of acceptable management arrangements and a suitable offset.

Table 14: MNES – ecological communities

MNES	Assessment
Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVP)	Present on the wind farm site. Removal of 28.74 hectares of vegetation. Significant impact. Removal of habitat subject to development of acceptable management arrangements and a suitable offset.
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (SHWTLP)	Present on the wind farm site. Removal of 0.82 hectares of vegetation. Significant impact. Removal of habitat subject to development of acceptable management arrangements and a suitable offset.
Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEVVVP)	Present on the wind farm site. Removal of 0.36 hectares of vegetation. Significant impact. Removal of habitat subject to development of acceptable management arrangements and a suitable offset.

Quarry

The assessment of biodiversity at the quarry site, including MNES, is contained in the BL&A Biodiversity Assessment in Technical Appendix G to the EES main report. A total of 0.468 hectares of Plains Grassland EVC in five remnant patches were detected at the site. A total of 0.13 hectares of native vegetation is proposed to be impacted by the quarry. A summary of the assessment is presented below:

- Five EPBC Act listed flora species have the potential to be present (Trailing Hop-bush, Clover Glycine, White Sunray, Button Wrinklewort and Large-headed Fireweed). During detailed design further targeted surveys will be undertaken for these five species.
- While no EPBC Act listed fauna species are considered likely to occur at the quarry site, 0.13 hectares of Plains Grassland will be removed. It is assumed this would potentially support Striped Legless Lizard and Golden Sun Moth. This will require a suitable offset.
- An area of 0.166 hectares of Natural Temperate Grasslands of the Victorian Volcanic Plains (NTGVVP) occurs on the site. This will not be impacted by the proposed quarry.

Proposed EMMs

The EES main report proposes the following EMMs to manage and minimise impacts on MNES:

- Avoid direct impacts on listed flora species (Trailing Hop-bush, Spiny Rice-flower) by temporary fencing of areas as no go zones and utilising an ecologist to ensure the fencing is done accurately.
- Avoid direct impacts on listed fauna species (Growling Grass Frog, Yarra Pygmy Perch) by siting infrastructure at least 100 metres from waterways and 100 metres from confirmed Growling Grass Frog wetlands.
- Offset direct impacts for the removal of habitat for Striped Legless Lizard habitat and Golden Sun Moth in accordance with the Commonwealth Offset Assessment Guide.
- Offset direct impacts for the removal of listed ecological communities in accordance with the Commonwealth Offset Assessment Guide. Further reduce risk to these

ecological communities by marking retained vegetation on construction drawings and delineating 'no-go' zones with temporary fencing and signage.

15.2 Evidence and submissions

Comments from submissions relating to MNES are provided together with other submissions on flora and fauna in Chapters 5 and 6 of this Report. A more detailed description of the assessment outcome for EPBC Act listed matters is also provided in those Chapters.

DELWP Environment considered the risk to EPBC Act listed migratory birds (White-throated Needletail, Fork-tailed Swift) to be minimal, based on the information provided in the assessment about available habitat in the area. It advised that subject to permit conditions requiring a suitable Threatened Species Management Plan, the Project will not pose an unacceptable risk or consequence to the state-wide population of Striped Legless Lizard, Growling Grass Frog or Golden Sun Moth.

Mr Lane's evidence was that significant impacts on EPBC Act listed Spiny Rice-flower and Trailing Hop-bush will be avoided with the implementation of the proposed EMMs. DELWP Environment supported the inclusion of these actions in a Threatened Species Management Plan. Targeted surveys are recommended pre-construction along the transmission line route, to enable poles to be located to avoid impacts on any listed flora.

Mr Lane's evidence was that the impacts on three listed ecological communities have been mitigated through the application of avoid and minimise principles during design of the Project, which is discussed in detail in Chapter 6. Offset requirements for the proposed wind farm have been estimated as follows:

- for Natural Temperate Grasslands of the Victorian Volcanic Plains, approximately 150 hectares will be required
- for Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains, approximately 3 hectares will be required
- for Grassy Eucalypt Woodland of the Victorian Volcanic Plain, approximately 0.7 hectares will be required.

Vegetation offset requirements for the quarry site will be incorporated into the Commonwealth offset requirements for the proposed wind farm. Suitable offset sites have been identified as being available. The offset for the Natural Temperate Grasslands of the Victorian Volcanic Plains will be co-located with Striped Legless Lizard and Golden Sun Moth habitat offsets. EMMs have been identified for incorporation into a Native Vegetation Management Plan to further reduce the risk to these communities.

15.3 Discussion

The Panel considers that the Proponent has appropriately applied the avoid and minimise principles in an attempt to reduce vegetation removal. The area of vegetation proposed for removal has been reduced from 102.35 hectares for the initial wind farm layout to 49.052 hectares (including wetland assessment) in the final proposed layout. The Panel is satisfied that impacts on EPBC Act listed plant species will be minimised to the extent practicable, and that residual impacts are acceptable.

The Project will impact on Striped Legless Lizard and Golden Sun Moth habitat, with approximately 44 hectares of habitat to be removed. Offset requirements under the EPBC Act have been estimated. Approximately 90 hectares of Striped Legless Lizard habitat and approximately 150 hectares of Golden Sun Moth habitat will be required. Available offset sites have been identified within the Project site or on neighbouring properties, and will be co-located.

The Panel agrees with DELWP Environment that subject to the implementation of the proposed EMMs through permit conditions, the Project will not have an unacceptable risk or consequence to the state-wide populations of Striped Legless Lizard, Growling Grass Frog and Golden Sun Moth. The Panel is satisfied that impacts on the Yarra Pygmy Perch will be avoided. The Panel accepts that the risk to EPBC Act listed migratory birds (White-throated Needletail and Fork-tailed Swift) is expected to be minimal based on the lack of available habitat within the development area.

Vegetation and habitat offsets are required to address the impact on MNES. Offset areas have been identified as being available within the wind farm site or adjacent areas, however acceptance of these areas as being appropriate for both the wind farm and the quarry is subject to the agreement of the Commonwealth Government.

The Panel notes that surveys for Striped Legless Lizard were only conducted in the southeast part of the wind farm site. Nevertheless, the area of Striped Legless Lizard habitat to be removed has been equated with the total area of Plains Grassland proposed to be removed across the site. This has been included in calculating the required offset.

A number of mitigation measures and performance requirements are proposed for incorporation in a Flora and Fauna Management Plan and a Native Vegetation Management Plan to reduce the risk to MNES. The Panel is satisfied that the EMMs are appropriate, and can be implemented through permit conditions.

15.4 Conclusions

The Panel finds that the impact of the Project on MNES is acceptable, subject to:

- negotiation of a suitable offset strategy with the Commonwealth Government
- inclusion and implementation of recommended mitigation measures in a Flora and Fauna Management Plan and Native Vegetation Management Plan
- pre-construction targeted flora surveys being undertaken for listed flora species during the detailed design of the Project, to assist with the location of transmission line poles to avoid impacts on listed flora species
- pre-construction targeted flora surveys being undertaken for listed flora species at the quarry site.

These measures can be implemented by conditions on the planning permit. The Panel has included suitable planning permit conditions in Appendix F.

For ease of reference, the Panel repeats below the recommendation it made regarding MNES in its assessment of the Environmental Management Framework in Chapter 14.2:

The Commonwealth Minister for the Environment should have regard to the requirements of Environmental Management Measures BD002 and 006 when

considering whether (and on what terms) to approve the Project as a controlled action under the EPBC Act.

EMMs BD002 and 006 (which are identical) are set out below:

Before development starts, an Offsets Strategy is to be approved and implemented to the satisfaction of the Commonwealth Minister for the Environment in accordance with the Commonwealth Offsets Assessment Guide (DoEE) to offset Project impacts on EPBC Act listed threatened ecological communities.

Appendix A Terms of Reference

Terms of Reference

Golden Plains Wind Farm Project – Inquiry

An Inquiry appointed pursuant to section 9(1) of the *Environment Effects Act 1978* to report on the Golden Plains Wind Farm Project.

Name

1. The Inquiry is to be known as the Golden Plains Wind Farm Inquiry¹.
2. The Inquiry members have the following skills/experience:
 - a. biodiversity and habitat;
 - b. land use planning (including noise, landscape and visual, and social impacts);
 - c. wind farm and power infrastructure; and
 - d. cultural heritage.

The Inquiry may seek additional specialist expert advice if required.

Purpose

3. The Inquiry's purpose is to inquire into and provide an integrated assessment of the potential effects of the proposed Golden Plains Wind Farm Project (the project).
4. The Inquiry is to produce a report to inform the Minister for Planning's assessment of the environmental effects of the project under the *Environment Effects Act 1978* (the EE Act) and in turn assist statutory decision making required for the project, including under the *Planning and Environment Act 1987* (P&E Act).
5. In overview, the Inquiry is to consider submissions received and the exhibited Environment Effects Statement (EES) documentation and report on the potential environmental effects of the Golden Plains Wind Farm, proposed on-site quarry and electricity transmission and other associated infrastructure investigated in the EES.

Background

Project

6. WestWind Energy Pty Ltd proposes to construct a wind farm of up to 228 wind turbines with a maximum blade tip height of 230 metres above ground level and an indicative generation capacity of 800-1000 megawatts. The project is located in Golden Plains Shire, about 60 kilometres west of Geelong, generally to the west, south and south-east of Rokewood township.
7. Proposed permanent ancillary infrastructure includes up to six permanent wind monitoring masts approximately 100 metres high, a terminal station, four collector substations, underground and above ground power transmission lines and access tracks. Temporary infrastructure for the construction period includes on-site concrete batching plants, an on-site quarry, cleared construction laydown areas, temporary construction compounds and facilities and site parking.
8. The terminal station will connect the on-site substations to the 500 kilovolt Heywood-Moorabool transmission line.
9. The project will have an expected operational life of about 25 years.

¹The Inquiry members will also be appointed as a Panel under the *Planning and Environment Act 1987* (P&E) Act to consider objections to the related planning permit application for the Golden Plains Wind Farm Project – a single consolidated report with content meeting the requirements of both the EE Act and the P&E Act is to be prepared.

Terms of Reference | Golden Plains Wind Farm – Inquiry

EES decision

10. On 9 July 2017, the Minister for Planning determined that an EES was required for the project under the EE Act and issued the decision with procedures and requirements for the preparation of the EES under section 8B(5) of the EE Act (Attachment 1).
11. The EES was prepared by the proponent in response to the Minister's decision and Scoping Requirements issued for the proposal in December 2017.
12. The EES was placed on public exhibition together with a planning permit application pursuant to the Golden Plains Planning Scheme, from 4 May to 18 June 2018.

Commonwealth approval

13. The project was determined to be a controlled action requiring assessment and approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 24 July 2017 (Attachment 2), because of its potential impacts on matters of national environmental significance (NES). The controlling provisions under the EPBC Act relate to listed threatened species and communities (sections 18 and 18A).
14. The EES process is being applied as an accredited assessment process under the Commonwealth-Victorian Bilateral Agreement for Environmental Impact Assessment², to provide for the assessment of matters of NES required under the EPBC Act. The Victorian Minister for Planning's assessment under the EE Act will be provided to the Commonwealth to inform the EPBC Act approval decision, in accordance with requirements of the Bilateral Agreement.

Planning approvals

15. WestWind Energy Pty Ltd has prepared a planning permit application for the use and development of the wind energy facility (permit application PA1700266). The members of the Inquiry will also be appointed as a Panel under the P&E Act to consider submissions (including objections) in relation to the planning permit application.

Other approvals

16. Under Victorian law, the project requires several other approvals and consents, as outlined in the EES, including but not limited to:
 - a. approved cultural heritage management plans for the wind farm under the *Aboriginal Heritage Act 2006* to manage works in areas of cultural heritage sensitivity; and
 - b. a work plan and work authority for extractive industry under the *Mineral Resources (Sustainable Development) Act 1990*.

Method

17. The Inquiry may apply to vary these Terms of Reference in writing, prior to submission of its report.
18. The Inquiry may inform itself in any way it sees fit, but must consider:
 - a. the exhibited EES;
 - b. any submissions and evidence provided by the proponent, State agencies, and the public (including both written submissions in response to the exhibited EES and the planning permit application and submissions presented during the Inquiry's hearing);
 - c. information provided by the proponent which addresses, to the extent practicable, the submissions provided by the public; and
 - d. other relevant information provided to, or obtained by, the Inquiry, having regard to relevant statutory provisions, policies and plans.

²The current agreement came into operation in December 2014 and provides for the accreditation of specified Victorian statutory processes, including the EES process, to enable assessment of MNES for actions requiring Commonwealth approval.

Terms of Reference | Golden Plains Wind Farm – Inquiry

19. The Inquiry must conduct a public hearing and may make other such enquiries as are relevant to its consideration of the potential environmental effects of the project.
20. The Inquiry must conduct its hearings in accordance with the following principles:
 - a. the hearings will be conducted in an open, orderly and equitable manner, in accordance with the rules of natural justice, with a minimum of formality and without the necessity for legal representation;
 - b. the Inquiry process will aim to be exploratory and constructive and adversarial behaviour should be minimised; and
 - c. parties without legal representation will not be disadvantaged – cross-examination will be strictly controlled and prohibited where deemed not to be relevant by the Inquiry Chair.
21. The Inquiry will meet and conduct hearings when there is a quorum of at least two of its members present including the Inquiry Chair.

Submissions are public documents

22. The Inquiry must retain a library of any written submissions or other supporting documentation provided to it directly until the Minister has issued his assessment in the light of the Inquiry's report or five years has passed from the time of its appointment.
23. Any written submissions or other supporting documentation provided to the Inquiry must be available for public inspection until the submission of its report, unless the Inquiry specifically directs that the material is to remain 'in camera'.

Report

24. The Inquiry must produce a written report for the Minister for Planning presenting the Inquiry's:
 - a. description of the proceedings conducted by the Inquiry and lists of those who made submissions, were heard and were consulted by the Inquiry;
 - b. findings on the likelihood and significance of environmental effects (impacts) of the different components of the project documented in the EES, including specific findings about impacts on matters of NES protected under relevant controlling provisions of the EPBC Act;
 - c. advice regarding the availability and effectiveness of proposed feasible mitigation measures or controls to prevent, minimise or compensate for environmental effects (including on relevant matters of NES), in the context of relevant standards, objectives and guidelines established under relevant legislation;
 - d. recommendations on any necessary modifications to the project and/or specific design measures required to prevent, minimise or compensate for adverse effects (including on relevant matters of NES);
 - e. recommendations on appropriate approval conditions that could be applied under Victorian law, necessary to achieve acceptable environmental outcomes in the context of applicable legislation and policy and of proponent commitments;
 - f. recommendations on the draft framework for environmental management for the project described in the EES, including in relation to the necessary controls, procedures or mechanisms; and
 - g. conclusions (supported by information and analysis) on whether the project will substantially meet evaluation objectives and deliver an appropriate balance of environmental, economic and social outcomes, having regard to public submissions, and the principles and objectives of ecologically sustainable development.

Timing

25. The Inquiry is required to submit its report in writing to the Minister for Planning within 30 business days from its last hearing date.

Terms of Reference | Golden Plains Wind Farm – Inquiry

Fee

26. The members of the Inquiry will receive the same fees and allowances as a panel appointed under Division 1 of Part 8 of the *Planning and Environment Act 1987*.
27. The costs of the Inquiry will be met by WestWind Energy Pty Ltd.

Project Manager

28. Day to day liaison for matters about this Inquiry process can be made to Greta Grivas, Senior Project Officer, Planning Panels Victoria on ph. (03) 8392 5121 or greta.grivas@delwp.vic.gov.au
29. Any queries about the EES process should be directed to Jack Krohn, Senior Impact Assessor, Department of Environment, Land, Water & Planning on ph. (03) 8392 5470.



Richard Wynne MP
Minister for Planning

Date: 27/5/18

Appendix B Submitters to the EES

No.	Submitter
1	John Bowman
2	Andrea Hamilton
3	Hamish Cumming
4	Suzanne Kirby
5	Kathy and Brian Woods
6	Patrick Banks and Helen Banks
7	Clive Farming Pty Ltd
8	David and Donna Ryan
9	Olivia and Luke Ryan
10	Marisa Bath
11	Regional Victorians OTDS Inc.
12	Colac Otway Shire Council
13	Kathy and Brian Woods
14	EPA Victoria
15	Adam and Kellie Walton
16	Birdlife Australia Victoria Group
17	Anne Hood
18	Bennett James Coad and Samantha Lee Coad
19	James Taylor
20	Andrew Garnsey
21	Department of Economic Development, Jobs, Transport and Resources – Earth Resources Division
22	Sally Wills
23	Department of Environment Land Water and Planning – Environment Portfolio
24	David Craig Tomkins
25	Dr Robert Reed
26	Ian and Patricia Taylor
27	John Delpratt

Appendix C Submitters to the planning permit application

No.	Submitter
PP01	Golden Plains Shire Council
PP02	Southern Rural Water
PP03	AusNet Transmission Group
PP04	DELWP Environment
PP05	Ross Peel
PP06	Phyllis Jacka
PP07	David and Amanda Johnson
PP08	Kevin and Jenny Blake
PP09	Daryl and Yvonne Richardson
PP10	Alan and Janene Wishart
PP11	John and Sharon Clatham
PP12	Noel Dean
PP13	Peter Cliton
PP14	Greg and Maxine Butler
PP15	Adam and Kellie Walton
PP16	EPA Victoria
PP17	Corangamite Catchment Management Authority
PP18	Neilson and Kylie Carr
PP19 (EES03)	Hamish Cumming
PP20 (EES06)	Patrick and Helen Banks
PP21 (EES08)	David and Donna Ryan
PP22 (EES15)	Adam and Kellie Walton
PP23 (EES20)	Andrew Garnsey
PP24 (EES22)	Sally and Alistair Wills
PP25 (EES25)	Robert Reed
PP26 (EES26)	Ian and Patricia Taylor
PP27	Lou Baxter
PP28 (EES27)	John Delpratt
PP29	CASA

Appendix D Parties to the Panel Hearing

Submitter	Represented by
Department of Environment Land Water and Planning (DELWP) (delegate of the Minister for Planning as responsible authority)	Tim Doolan
DELWP Impact Assessment Unit	Geoff Ralphs and Jack Krohn
Golden Plains Shire Council	Laura Wilks
WestWind Energy Pty Ltd	Tim Power of White & Case, assisted by Irene Argeres, Michelle Keen and Zachary Tyler, who called the following expert witnesses: <ul style="list-style-type: none"> - Allan Wyatt of XURBAN on landscape and visual impacts - Ian Jennings of Chiron Aviation Consultants on aviation matters - Christophe Delaire of Marshall Day Acoustics on acoustic impacts - Tom Evans of Resonate Consultants on acoustic impacts peer review - Brett Lane of Brett Lane & Associates on flora and fauna impacts - Ian Smales of Biosis on Brolga impacts review
Adam and Kellie Walton	Tom Pikusa of Counsel instructed by Dominica Tannock of DST Legal, who called the following expert witnesses: <ul style="list-style-type: none"> - Dr Robert Thorne of Noise Measurement Services on acoustic impacts
DELWP Environment portfolio	Lisa McCaulay, Christine Ferguson, Nathan MacDonald and Clare Tesselaar from Grampians Region
Birdlife Australia Victoria Group	Peter Wolcott
Regional Victorians OTDS Inc.	Kerrie Allen
Hamish Cumming	
Noel Dean	
Bennett James and Samantha Lee Coad	
James Taylor	
Kathy and Brian Woods	
Kevin and Jenny Blake	
John Delpratt and Lincoln Kern	
Peter Clifton	
Ross Peel	
Sally Wills	
Dr Robert Reed	

Appendix E Document list

No.	Date	Description	Presented by
1	6/7/2018	Brett Lane & Associates Pty Ltd Letter dated 18 June 2018 regarding proposed vegetation removal to include DELWP wetlands	Mr Tim Power of White & Case for WestWind Energy Pty Ltd
2	6/7/2018	Response dated 2 July 2018 to DELWP Environment Portfolio request for further information relating to Salinity Management Overlay	Mr Power
3	6/7/2018	Map – grid connection layout comparison (Jacobs)	Mr Power
4	13/7/18	DELWP Planning draft without prejudice permit conditions PA1700266	Mr Tim Doolan, DELWP – Planning Portfolio
5	13/7/18	DELWP Planning Part A submission	Mr Doolan
6	13/7/18	Proponent draft without prejudice permit conditions	Mr Irene Argeres, White and Case
7	23/7/18	Cover letter from White & Case dated 23 July 2018 attaching Document 8	Mr Zachary Tyler of White & Case
8	23/7/18	Letter dated 11 July 2018 from Simon Clifton, Project Manager at WestWind Energy to Department of Environment and Energy (DoEE) enclosing WestWind Energy's response to EPBC Act matters	Mr Tyler
9	30/7/2018	Mr Cumming email dated 29 July 2018	Mr Hamish Cumming
10	30/7/2018	DNV-GL Letter dated 27 July 2018	Mr Power
11	30/7/2018	Discussion between DELWP and White & Case relation to buffers – emails and Symbolix letter	Mr Power
12	30/7/2018	CFA letter dated 17 July 2018	Mr Power
13	30/7/2018	DELWP Letter dated 20 July 2018 in relation to Salinity Management Overlay	Mr Power
14	30/7/2018	Corangamite CMA response to draft conditions dated 26 July 2018	Mr Power
15	30/7/2018	GHD letter to WestWind Energy dated 24 July 2018 with attachments on shadow flicker	Mr Power
16	30/7/2018	Conclave statement between Mr Delaire, Mr Evans and Dr Thorne (noise experts)	Mr Power
17	30/7/2018	Letter to Ms Di Fazio, Executive Archaeologist and Senior Consultant, Heritage Insight Pty Ltd, from Mr Steven Avery, Executive Director, Heritage Victoria, dated 24 July 2018 relating to cobbled laneway	Mr Power

No.	Date	Description	Presented by
18	30/7/2018	Letter from Jacobs dated 27 July 2018 on quarry approvals	Mr Power
19	30/7/2018	ESG advice in relation to landfill and landfill gas dated 27 July 2018	Mr Power
20	30/7/2018	DELWP Planning Part B submission	Mr Doolan
21	30/7/2018	Zoning and overlay maps (Jacobs)	Mr Doolan
22	30/7/2018	DELWP Impact Assessment Unit submission on EES process	Mr Geoff Ralphs, DELWP Impact Assessment Unit
23	30/7/2018	Golden Plains Shire Council submission and attachments	Ms Laura Wilks of Golden Plains Shire Council
24	30/7/2018	WestWind opening submission	Mr Power
25	30/7/2018	White & Case attachments to opening submission	Mr Power
26	1/08/2018	Annotated copy of document 4, revised DELWP without prejudice permit conditions	Mr Doolan
27	1/08/2018	Updated BL&A Figure 2 annotated with road names	Ms Argeres
28	1/08/2018	Site visit booklet	Ms Argeres
29	1/08/2018	Mr Dean email in response to Document 9	Mr Noel Dean
30	1/08/2018	Panel's written questions for DELWP Environment	Planning Panels Victoria
31	1/08/2018	Mr Allan Wyatt – Landscape visual assessment Expert Witness Statement	Mr Power
32	1/08/2018	Mr Ian Jennings – Aviation Expert Witness Statement	Mr Power
33	1/08/2018	Noise engagement letter for Marshall Day Acoustics from White and Case	Mr Power
34	1/08/2018	Marshall Day Acoustics proposal with commercial redactions	Mr Power
35	2/08/2018	Panel's response to Document 9	Planning Panels Victoria
36	2/08/2018	Emails in relation to Marshall Day Acoustics instruction for EES scope of work	Mr Power
37	2/08/2018	PowerPoint presentation of Mr Delaire	Mr Power
38	2/08/2018	Mr Christophe Delaire – Expert Witness Statement on noise	Mr Power
39	2/08/2018	Folder of various documents, including New Zealand Standard 6808:2010 and Dr Robert Thorne's Expert Witness Statement on noise	Mr Tom Pikusa of Counsel for Mr and Ms Walton

No.	Date	Description	Presented by
40	7/08/2018	Mr Thomas Evans Expert Witness Statement on noise	Mr Power
41	7/08/2018	Part A submission on behalf of the Waltons	Mr Pikusa
42	8/08/2018	Mr Taylor submission	Mr James Taylor
43	8/08/2018	Jacobs letter to WestWind dated 6 August 2018 regarding terminal station	Mr Power
44	8/08/2018	Water Technology letter to WestWind dated 27 July 2018 regarding surface water	Mr Power
45	8/08/2018	Email from Ken McAlpine, Managing Director, Spring Street Advisory Pty Ltd to Lisa Opray (DELWP Environment) dated 12 July 2018	Mr Power
46	8/08/2018	Mr Brett Lane Expert Witness Statement on biodiversity and Brolga	Mr Power
47	8/08/2018	Mr Brett Lane PowerPoint presentation	Mr Power
48	8/08/2018	Guideline to managing Brolga habitat on your farm	Mr Brett Lane, BL&A
49	8/08/2018	Memo from Brett Lane & Associates on updated Expert Witness Statement	Mr Power
50	8/082018	Mr Ian Smales, Biosis, Expert Witness Statement on Brolga peer review	Mr Power
51	9/08/2018	Dundonnell Wind Farm Symbolix report	Mr Power
52	9/08/2018	Aerial photo VP3 A3	Mr Power
53	9/08/2018	Aerial photo VP21 A3	Mr Power
54	9/08/2018	WestWind main submission	Mr Power
55	9/08/2018	The Guardian article on aviation warning lights	Mr Wolcott, Bird Life Australia
56	9/08/2018	PowerPoint presentation	Ms Kerrie Allen, Regional Victorians OTDS
57	9/08/2018	Professor Broadbridge paper <i>Collisions between large birds and wind turbines</i>	Mr Cumming
58	9/08/2018	Various materials, private and confidential	Mr Noel Dean
59	9/08/2018	Various materials, private and confidential	Mr Dean
60	9/08/2018	Kaiser Wilhelm Koog Windtest report for Acciona windfarm in Spain	Mr Dean
61	9/08/2018	Noise measurement services report July 2010	Mr Dean
62	9/08/2018	Various materials, private of confidential	Mr Dean
63	9/08/2018	Various materials, confidential and private	Mr Dean

No.	Date	Description	Presented by
64	9/08/2018	Various materials, private and confidential	Mr Dean
65	9/08/2018	Various materials, private and confidential	Mr Dean
66	9/08/2018	Various materials, private and confidential	Mr Dean
67	10/08/2018	Submission Bennett and Samantha Coad	Mr Bennett Coad
68	10/08/2018	2 x photos of Brolga on the Coad property	Mr Bennett Coad
69	10/08/2018	Site visit booklet annotated to show Brolga sites on the Coad property	Mr Bennett Coad
70	10/08/2018	Aerial photo mark ups showing wetlands north of the Cressy-Shelford Road (on Russell Coad's property)	Mr Bennett Coad
71	10/08/2018	DELWP Environment submission	Ms Lisa McCaulay of DELWP Environment
72	10/08/2018	DELWP Q&A to PPV questions	Ms McCaulay
73	10/08/2018	Kevin and Jenny Blake submission	Kevin and Jenny Blake
74	10/08/2018	Submission by John Delpratt and Lincoln Kern	Mr John Delpratt
75	10/08/2018	Submission by Peter Clifton	Mr Peter Clifton
76	10/08/2018	Submission by Sally and Alastair Wills	Ms Sally Wills
77	10/08/2018	Photo of landscape looking roughly north from Shearer's Quarters at Naringal Station	Ms Wills
78	10/08/2018	Submission by Mr and Ms Woods	Ms Kathy Woods
79	10/08/2018	Attachments to Woods submission	Ms Woods
80	10/08/2018	Marked up Figure 2 BL&A plan showing turbines that the Woods would like removed	Ms Woods
81	10/08/2018	Biosis report on Mount Fyans Brolga Assessment, July 2017	Mr Power
82	10/08/2018	BL&A memo on Symbolix report	Mr Power
83	10/08/2018	BL&A Plan, 700m turbine free buffers	Mr Power
84	10/08/2018	BL&A Plan, 1000m turbine free buffers	Mr Power
85	10/08/2018	BL&A Plan, Biosis Mount Fyans turbine free buffers	Mr Power
86	10/08/2018	BL&A Plan, BL&A Habitat model turbine free buffers	Mr Power
87	10/08/2018	BL&A Plan, 3.2km turbine free buffers (as per Brolga Guidelines)	Mr Power
88	10/08/2018	Note by Mr Geiger, WestWind Energy, on designing the wind turbine layout for the Golden Plains Wind Farm	Mr Power
89	10/08/2018	Mt Mercer Fire Brigade letter, fax dated 8/11/2016	Mr Power

No.	Date	Description	Presented by
90	13/08/2018	BL&A Memo final response to Panel questions	Mr Power
91	13/08/2018	Symbolix additional information on collision risk modelling for Broilga	Mr Power
92	13/08/2018	Jacobs Table 1 - Environmental Management Measures – Explanation of Statutory Implementation	Mr Power
93	13/08/2018	WestWind Energy – Outline of Reply submission	Mr Power
94	13/08/2018	Revised draft without prejudice permit conditions	Mr Power
95	13/08/2018	Community survey copy, Bath Swamp landowner	Mr Power
96	13/08/2018	DELWP Environment version of without prejudice permit conditions	Ms Clare Tesselaar, DELWP Environment
97	13/08/2018	Excerpt of conditions from Hawkesdale Wind Farm permit	Ms Tesselaar
98	14/08/2018	DELWP Planning's final set of preferred without prejudice draft conditions	Mr Doolan
99	10/08/2018	Submission by H Cumming including attachments	Mr Cumming
100	15/08/2018	Submission on behalf of A and K Walton including attachments	Mr Pikusa
101	16/08/2018	DELWP Environment's response to questions from the Panel put at the Hearing on 10 August 2018	Ms Christine Ferguson, DELWP Environment
102	16/08/2018	DELWP Environment's response to B Lane's Expert Witness Statement	Ms Ferguson

Appendix F Panel version of recommended permit conditions

DEVELOPMENT PLANS

1. Before development starts, development plans must be submitted to, approved and endorsed by the responsible authority. When endorsed, the plans will form part of this permit.

The plans must be fully dimensioned and drawn to scale. The plans must be generally in accordance with the application plans '*Golden Plains Wind Farm: Site Layout – Inset Maps 1-6*,' dated 24 April 2018 (Jacobs), and must include:

- a. the final location, specifications, materials and finishes of the wind energy facility
 - b. a maximum of 228 turbines (reduced as required to comply with condition 1(c)) with the following specifications:
 - i. maximum blade tip height of up to 230 metres above ground level
 - ii. minimum blade tip clearance from ground level no less than 40 metres.
 - c. turbine free buffer zones for Brolga generally in accordance with Document 86 presented to the Golden Plains Wind Farm EES Inquiry and Panel, 'Brett Lane & Associates Plan, BL&A Habitat model turbine free buffers', with the final boundaries to be agreed with DELWP Environment
 - d. realignment of the proposed grid connection powerline between the collector station on Bells Road and the 500kV terminal station on Geggies Road to avoid Baths Swamp and associated peripheral wetland dependent vegetation
 - e. clear delineation of the boundary for the transmission station site, which must not intrude into the boundary of the Plains Grassy Wetland Ecological Vegetation Class boundary. The boundary of the transmission site must be approved by the DELWP Environment Portfolio
 - f. the final design and location of any proposed business identification signage
 - g. the location and extent of native vegetation to be removed under this permit
 - h. no buildings or structures on the existing Ausnet Transmission Group easement, except for access tracks, underground cables and interface works required for the connection of the wind farm electrical system to the existing 500kV Moorabool to Mortlake/Tarrone transmission line
 - i. no aviation safety lighting on any turbine.
2. The colours and finishes of all buildings and works (including turbines) must be non-reflective, to minimise the visual impact of the development on the surrounding area.
 3. Except as permitted under conditions 5 and 7, the use and development must be generally in accordance with the endorsed plans. The endorsed plans must not be altered or modified without the written consent of the responsible authority.

STAGING

4. The use and development may be completed in stages. Any corresponding obligations arising under this permit may be similarly completed in stages.

MICRO-SITING OF TURBINES

5. Before development starts, a Micro-Siting Plan must be submitted to, approved and endorsed by the responsible authority, identifying a footprint at ground level within which each turbine may be located. When endorsed the plan will form part of this permit.

The Micro-Siting Plan must be fully dimensioned and drawn to scale. The footprint for each turbine identified on the Micro-Siting Plan:

- a. must not extend more than 100 metres in any direction from the centre of the turbine at ground level as shown on the development plans endorsed under condition 1
 - b. must not be within 1 kilometre of a dwelling unless evidence is provided to the satisfaction of the responsible authority that the owner of the dwelling has consented in writing to the location of the turbine footprint
 - c. must not be located within the turbine-free buffers referred to in condition 1(c)
 - d. must not result in a material adverse impact on remnant native vegetation (including Plains Grassland vegetation and threatened flora species), or habitat for Growling Grass Frog, Striped Legless Lizard or other species listed as threatened under the *Flora and Fauna Guarantee Act 1988* or threatened or migratory under the *Environment Protection and Biodiversity Conservation Act 1999*.
6. The Micro-Siting Plan must be submitted with written advice from a suitably qualified ecologist, to the satisfaction of the responsible authority, confirming that the Micro-Siting Plan meets the requirements specified in condition 5(d).
 7. Any changes to access tracks, electricity cabling and associated infrastructure arising from micro-siting a turbine in accordance with an endorsed Micro-Siting Plan are permitted without requiring the consent of the responsible authority or any amendments to the development plans endorsed under condition 1.
 8. The endorsed Micro-Siting Plan must not be altered or modified without the written consent of the responsible authority.

LANDSCAPING

Off-site Landscaping Program

9. Before development starts, an off-site landscaping program developed in consultation with Golden Plains Shire Council must be submitted to, approved and endorsed by the responsible authority. When endorsed the program will form part of this permit.

The Off-site Landscaping Program must:

- a. provide for off-site landscaping to reduce the visual impact of the turbines at or within the vicinity of any dwelling within 5 kilometre of a wind turbine(s)
- b. include a methodology for determining:

- i. the type of landscaping treatments to be proposed, which must be tailored to the particular property and agreed with the landowner
 - ii. a timetable for establishing and maintaining the landscaping for at least two years
 - c. include a process for making offers to affected landowners to either:
 - i. establish and maintain the landscaping on the landowner's land, including watering, for a period of at least two years; or
 - ii. make a cash contribution in lieu (which must be sufficient to cover the cost of the landowner establishing and maintaining the landscaping, including watering, for a period of at least two years)
 - d. include a process for recording offers that have been made to landowners, whether or not the offers are accepted and when and how offers will be actioned following acceptance
 - e. include a process for the provision of progress reports regarding the implementation of the endorsed Off-site Landscaping Program, to be provided to the responsible authority annually from the date of this permit for 5 years, and at other times on request.
10. The endorsed Off-site Landscaping Program must be implemented to the satisfaction of the responsible authority. The endorsed Off-site Landscaping Program must not be altered or modified without the written consent of the responsible authority.

On-site Landscaping Plans

11. Before development starts, landscaping plans for the transmission station and each collector station must be submitted to, approved and endorsed by the responsible authority.

All plans must specify the type of landscaping, timing of planting, height of plants at maturity and maintenance program.

The plan for the transmission station must:

- a. be prepared in consultation with the DELWP Environment Portfolio
 - b. address potential impacts on remnant native vegetation and Brolga habitat in the wetland adjacent to the transmission station site.
12. The landscaping plans endorsed under condition 11 must be implemented to the satisfaction of the responsible authority, and must not be altered or modified without the written consent of the responsible authority.

NOISE

In conditions 13-30:

- 'ancillary infrastructure' means the terminal station and collector stations
- 'the Standard' means New Zealand Standard 6808:2010, Acoustics – Wind Farm Noise

- ‘noise sensitive locations’ are locations defined as such in the Standard which existed as at the date of this permit
- ‘NIRV’ means EPA Publication 1411: Noise from Industry in Regional Victoria
- ‘noise sensitive areas’ are locations defined as such in the Glossary in NIRV
- ‘the first turbine operating’ means the time from which a turbine first commences generating electricity
- ‘the last turbine operating’ means the time from which a turbine first commences generating electricity.

Wind Farm Performance Requirement

13. Subject to condition 14 and condition 18(c)(i), at any wind speed, noise from the operation of the wind turbines, when measured at noise sensitive locations, must comply with the applicable limits in the Standard at all times.
14. If it is determined that sound from wind turbine(s) has a special audible characteristic at any noise sensitive locations, the measured sound level will have a penalty applied in accordance with the Standard.
15. The limits specified in condition 13 do not apply if an agreement has been entered into with the owner of the noise sensitive location that waives compliance with condition 13. Evidence of the agreement must be provided to the satisfaction of the responsible authority upon request, and be in a form that applies to the land upon which the noise sensitive location is located for the life of the wind energy facility.

Ancillary Infrastructure Performance Requirements

16. Subject to condition 17, noise from ancillary infrastructure associated with the wind energy facility must comply with noise levels for noise sensitive areas in accordance with NIRV at all times.
17. The limits specified in condition 16 do not apply if an agreement has been entered into with the owner of a noise sensitive area which waives compliance with condition 16. Evidence of the agreement must be provided to the satisfaction of the responsible authority upon request, and be in a form that applies to the land upon which the noise sensitive area is located for the life of the wind energy facility.

Compliance assessment

Pre-construction Noise Assessment

18. Before development starts, a Pre-construction Noise Assessment based on the final turbine layout and turbine model to be installed and the detailed design of the ancillary infrastructure must be prepared, submitted to and approved by the responsible authority. The approved Pre-construction Noise Assessment must be placed on the project website as soon as practicable.

The Pre-construction Noise Assessment must:

- a. be prepared in accordance with the Standard and NIRV, and must demonstrate to the satisfaction of the responsible authority that the facility will comply with the performance requirements specified in conditions 13 and 16
 - b. must include the collection of background noise monitoring of at least 4,032 valid data points for each representative site, analysis by 24 hour and night (10 pm to 7am) only periods, and for each time sector analysis for each 45 degree wind rose direction
 - c. include:
 - i. a specific acknowledgement that the areas in and around Rokewood that are zoned Township Zone and Low Density Residential Zone are a high amenity area for the purposes of the Standard
 - ii. an assessment as to whether the high amenity noise limit should apply to these areas and the appropriate threshold wind speed, based on the guidance in Clause C5.3.1 of the Standard.
19. The following data collected during the Pre-construction Noise Assessment must be retained in their original form and made available on request to the responsible authority, any person conducting a noise investigation report under the Noise Management Plan, or for independent review under conditions 26 to 29:
- a. background noise monitoring survey data, in their original form as recorded by each individual field sound level meter at each noise sensitive location at which monitoring was undertaken
 - b. wind speed and direction monitoring survey data, in their original form as recorded for assessment at each noise sensitive location at which monitoring was undertaken.

Near-field Compliance Testing Report

20. Prior to final commissioning and handover, a Near-field Compliance Assessment Report must be prepared which describes and assesses the results of the sound power level testing of a representative sample of turbines, including the presence or absence of special audible characteristics and tonal audibility levels, by either:
- a. verifying that the measured sound power levels (including any penalties), accounting for test uncertainty, are equivalent to or less than the values adopted as the basis of the Pre-construction Noise Assessment carried out under condition 18; or
 - b. verifying that predicted noise levels (including any penalties) determined on the basis of the measured sound power level test results are below the noise limits in condition 13 for noise sensitive locations, using the same prediction methodology used for the Pre-construction Noise Assessment carried out under condition 18.
21. If the measured sound power levels or tonal audibility levels are significantly different from the data referenced in the Pre-construction Noise Assessment, the Near Field Compliance Assessment Report must address these differences and outline whether additional sound power level testing is warranted to verify and assess the noise emissions of other wind turbines at the site.

Operating acoustic compliance assessment

22. A Post-construction Acoustic Compliance Report, must be prepared in accordance with the Standard and NIRV, which demonstrates whether the facility complies with the performance requirements specified in conditions 13 and 16 (including any penalty for special audible characteristics), must be submitted to the responsible authority within:
- a. 6 months of the first turbine operating (in respect of demonstrating compliance with condition 13); and
 - b. 6 months of the ancillary infrastructure commencing operations (in respect of demonstrating compliance with condition 16).

Further Post-construction Acoustic Compliance Reports prepared in accordance with this condition must be submitted to the responsible authority annually from the date of the first report being submitted until the final turbine is operating.

Noise Management Plan

23. Before development starts, a Noise Management Plan must be submitted to, approved and endorsed by the responsible authority. Prior to being submitted, the Proponent should advertise and seek public comment on the draft Noise Management Plan. When endorsed the Noise Management Plan will form part of this permit. Once endorsed, the plan must be placed on the project website for the life of the project.

The Noise Management Plan must specify details of:

- a. Near-field Compliance Testing Report, detailing how this testing and report will be prepared in accordance with IEC 61400-11:2012 *Wind turbines – Acoustic noise measurement techniques*, and which presents the measured turbine sound power levels, tonal audibility and special audible characteristics, including details of the representative sample of turbines to be tested.
 - b. Post-construction Acoustic Compliance Reports: detailing how these will be prepared in accordance with the Standard and NIRV, to demonstrate whether or not the facility complies with the performance requirements in conditions 13 and 16.
 - c. Noise Investigation Reports: detailing procedures for when complaints are received in accordance with the endorsed Complaints Investigation and Response Plan (condition 92) or when potential non-compliance with the performance requirements in conditions 13 and 16 is otherwise detected.
 - d. Noise Remediation Plans: detailing prompt actions to achieve compliance when non-compliance with the performance requirements in conditions 13 and 16 is found to have occurred.
 - e. The requirements for each of the documents referred to in condition 23(b), (c) and (d), including what matters they must address, and when they must be submitted.
24. The endorsed Noise Management Plan must be implemented to the satisfaction of the responsible authority. The endorsed Noise Management Plan must not be altered or modified without the written consent of the responsible authority.

25. The endorsed Noise Management Plan, any of the reports and plans referred to in condition 23 and any peer review or peer review report under conditions 27 and 28 must promptly be placed on the Proponent's website.

Peer review of noise reports and plans

26. The Pre-Construction Noise Assessment required under condition 18, the Noise Management Plan required under condition 23, and each report and remediation plan required under condition 23, must be prepared by a suitably qualified and experienced acoustician.
27. The Pre-Construction Noise Assessment required under condition 18, Noise Management Plan required under condition 23, acoustic compliance reports required under condition 22 and the noise remediation plan required under condition 23, must be accompanied by a peer review from an environmental auditor appointed under Part IXD of the *Environment Protection Act 1970* verifying that the report or plan is suitable, and meets the requirements of this permit.
28. If requested by the responsible authority, the noise investigation reports required under condition 23(c) must be accompanied by a report from an environmental auditor appointed under Part IXD of the *Environment Protection Act 1970* verifying that the report or plan is suitable, and meets the requirements of this permit.
29. If an auditor appointed under Part IXD of the *Environment Protection Act 1970* cannot be retained for any of the requirements under conditions 27 and 28, written consent of the responsible authority may be sought to provide a peer review from a suitably qualified and experienced independent acoustic engineer instead.
30. The environmental auditor or peer reviewer must be a different author to the author of the report being reviewed and must make an appropriate conflict of interest declaration.

SHADOW FLICKER

31. Shadow flicker from the facility must not exceed 30 hours per annum at any dwelling existing at the date of this permit, unless the operator has entered into an agreement with the relevant landowner waiving this requirement. Evidence of the agreement must be provided to the satisfaction of the responsible authority upon request, and be in a form that applies to the land for the life of the wind energy facility. The agreement must be to the satisfaction of the responsible authority.
32. Before development starts, an assessment of the potential effects of shadow flicker from turbines on dwellings existing at the date of this permit is to be undertaken for the final turbine layout in accordance with the Policy and Planning Guidelines for the Development of Wind Energy Facilities in Victoria, November 2017, and to the satisfaction of the responsible authority.

ELECTROMAGNETIC INTERFERENCE

33. Before development starts, a Signal Strength Survey must be submitted to, approved and endorsed by the responsible authority. Once endorsed, the survey will form part of the permit.

The survey must be to the satisfaction of the responsible authority and must:

- a. be carried out by a suitably qualified and experienced independent specialist
 - b. include testing at selected locations within five kilometres of the facility to enable the average signal strength for television, radio and other point to point services (including GPS autosteer functions used in agricultural operations) that could be impacted by electromagnetic interference from the wind energy facility to be determined
 - c. identify and consult with organisations operating point to point transmission links
 - d. include a mitigation strategy for impact to television and radio reception and point to point transmission.
34. If a complaint is received regarding the effect of the facility on television or radio reception at a dwelling existing at the date of this permit, or point to point transmission at any location, within five kilometres of the boundary of the site (as described in the Address of land at the beginning of this permit), then:
- a. the complaint must be investigated in accordance with the Complaint Investigation and Response Plan referred to in condition 92
 - b. if the investigation indicates that the facility has had a detrimental impact on the quality of reception or signal strength, restore reception/signal strength to at least the quality determined in the survey carried out under condition 33, to the satisfaction of the responsible authority.

TRAFFIC MANAGEMENT

Vehicle access points

35. Vehicle access points must be designed and located to the following standards, to the satisfaction of the relevant road management authority:
- a. truck movements to and from the site must be able to be accommodated on sealed roadways where available
 - b. to the extent practicable, access points must be able to accommodate turning movements without vehicles encroaching onto the incorrect side of the road
 - c. safe sight distances must be provided
 - d. potential through traffic conflicts must be avoided.

Traffic Management Plan

36. Before development starts, a Traffic Management Plan must be submitted to, approved and endorsed by Golden Plains Shire Council. When endorsed the plan will form part of this permit.

The Traffic Management Plan must:

- a. be prepared by a suitably qualified and experienced independent civil or traffic engineer
- b. specify measures to be taken to manage traffic impacts associated with the construction of the facility

- c. include a program to inspect, maintain and (where required) repair public roads used by construction traffic
 - d. be approved by the relevant road management authority prior to submission to Golden Plains Shire Council
 - e. identify, assess and appropriately eliminate, reduce or mitigate road safety hazards associated with the construction of the project
 - f. include measures to ensure that during the wind farm construction period, the level of service to any specified access road does not decrease below a level of C, at both mid-block and intersections, as defined in *Austrroads, 2013, Guide to Traffic Management: Traffic Studies and Analysis*
 - g. include measures to ensure that the pavement condition of all specified access roads at the end of the wind farm construction period is at least equal to the pavement condition of these roads at the start of the construction period (as described in the Pavement Impact Assessment undertaken under condition 38
 - h. address potential environmental and social impacts of associated with traffic generated by construction of the Project
 - i. identify any areas of roadside vegetation that may require removal, pruning or protection, the practices to be followed and any consents or approvals required.
37. The endorsed Traffic Management Plan must be implemented to the satisfaction of Golden Plains Shire Council. The endorsed Traffic Management Plan must not be altered or modified without the written consent of Golden Plains Shire Council. Any proposed alteration or modification to the endorsed Traffic Management Plan must be approved by the relevant road management authority prior to submission to Golden Plains Shire Council.

Pavement Impact Assessment

38. Before development starts, a Pavement Impact Assessment of public roads that may be used in connection with the construction and decommissioning of the facility, and proposed access points to the site is to be prepared in consultation with the relevant road management authorities prior to being submitted to, approved and endorsed by Golden Plains Shire Council.
39. The Pavement Impact Assessment will assess the suitability, design, condition and construction standard of the relevant public roads and access points, and must:
- a. be prepared by a suitably qualified and experienced civil or traffic engineer
 - b. identify any areas of roadside vegetation that may require removal, pruning or protection, the practices to be followed and any consents or approvals required
 - c. include recommendations, if any, regarding upgrades required to accommodate construction traffic.
40. Works required or recommended under the Pavement Impact Assessment and Traffic Management Plan are to be completed in accordance with the approved plans and program, to the satisfaction of the relevant road management authority.

Traffic upgrade works

41. Where works are recommended or required under the Pavement Impact Assessment or the endorsed Traffic Management Plan, the following are required to be submitted to and endorsed by the relevant road management authority:

- a. detailed plans for the required works
- b. a program indicating when the works will be undertaken.

The works must be completed in accordance with the approved plans and program, to the satisfaction of the relevant road management authority.

ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan

42. Before development starts, an Environmental Management Plan prepared in consultation with Golden Plains Shire Council must be submitted to, approved and endorsed by the responsible authority. When endorsed the plan will form part of this permit.

The Environmental Management Plan must:

- a. describe measures to minimise the amenity and environmental impacts of the construction and decommissioning of the facility
- b. be generally in accordance with Chapter 23 of the Golden Plains Wind Farm Environment Effects Statement
- c. be in accordance with all relevant Environment Protection Authority requirements and guidelines
- d. provide for, prior to commencement of the relevant construction activities, the clear demarcation on the ground of any areas to be avoided and not disturbed on the advice of a suitably qualified ecologist or cultural heritage advisor
- e. meet the requirements of conditions 44 to 50 below.

The Environmental Management Plan may be prepared in sections or stages.

43. The endorsed Environmental Management Plan must be implemented to the satisfaction of the responsible authority. The endorsed Environmental Management Plan must not be altered or modified without the written consent of the responsible authority.

Flora, fauna and native vegetation impacts

Flora and Fauna Management Plan

44. The Environmental Management Plan must include a Flora and Fauna Management Plan prepared in consultation with the DELWP Environment Portfolio. Once endorsed, the Flora and Fauna Management Plan must be made publicly available on the project website, and remain publicly available for the life of the project.

45. The Flora and Fauna Management Plan must include, as a minimum, the biodiversity management measures outlined in Chapter 23.6.1 of the Environmental Management Framework of the Golden Plains Wind Farm Environment Effects Statement and address or satisfy the following requirements:

- a. pre-construction targeted flora surveys must be undertaken for flora species listed under the *Flora and Fauna Guarantee Act 1988* and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), to assist with the location of transmission line poles to avoid impacts on listed flora species during the finalisation of the detailed design of the Project
- b. pre-construction targeted flora surveys being undertaken at the quarry site for flora species listed under the *Flora and Fauna Guarantee Act 1988* and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth)
- c. all habitat to be retained is to be clearly marked on construction drawings
- d. all habitat (including Plains Grassland vegetation and threatened flora species) to be retained is to be clearly marked on the ground (e.g. with temporary fencing and flagging, as well as signage) where located in close proximity to the development footprint, and designated as 'no-go zones'
- e. prohibition of the following activities within 'no-go zones', areas of native vegetation to be retained, and any tree or vegetation protection zone associated with the permitted use and/or development, except with the written consent of the responsible authority:
 - i. vehicular or pedestrian access
 - ii. trenching or soil excavations
 - iii. storage or dumping of any soils, materials, equipment, vehicles, machinery or waste products
 - iv. entry and exit pits for the provision of underground services
 - v. any other actions or activities that may result in adverse impacts to retained native vegetation
- f. all temporary construction disturbance areas to be located in existing cleared areas to avoid additional removal of remnant vegetation and mature trees
- g. where possible without promoting habitat for pest species, surface and embedded rocks will not be removed from the site and where possible these will be reintroduced when they are removed temporarily
- h. identify Growling Grass Frog wetland sites, and where possible avoid placing infrastructure within 100m of those sites
- i. all workers are to undergo training on measures to detect and avoid impacts to Striped Legless Lizard, advise the site manager when Striped Legless Lizard is found, and on avoiding 'no-go' zones
- j. a salvage and relocation protocol for Striped Legless Lizard must be prepared in compliance with the *Wildlife Act 1975*
- k. all machinery must enter and exit works sites along defined routes that do not impact on native vegetation or cause soil disturbance and weed spread

- I. all machinery brought onto the site and travelling between farming properties must be washed down to control spread of weeds and pathogens.

Bats and Avifauna Management Plan

In conditions 46 to 48:

- 'listed species' means all bird and bat taxa listed as threatened under the *Flora and Fauna Guarantee Act 1988* (FFG Act) and all bird and bat taxa listed as threatened or migratory under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- 'the first turbine operating' means the time from which a turbine first commences generating electricity
- 'the last turbine operating' means the time from which a turbine first commences generating electricity.

46. The Environmental Management Plan must include a Bat and Avifauna Management Plan (BAM Plan). The BAM Plan must be prepared in consultation with the DELWP Environment Portfolio. Once endorsed, the BAM Plan must be placed on the project website without delay, and remain on the website for the length of operation of the BAM Plan.

The BAM Plan must:

- a. include a statement of the objectives and overall strategy for minimising species mortality arising from the operation of the facility, which must include:
 - i. strategies to detect, manage and mitigate significant impacts on listed species and avifauna species (eg raptors) that are susceptible to collision with wind turbines due to collisions arising from the operation of the facility and any other bat
 - ii. a definition of 'significant impact'
- b. include appropriate contingency/response measures in the event of a significant impact occurring
- c. include a comprehensive, science-based monitoring program to monitor mortality of listed species and any other bat and avifauna species. The monitoring program must commence when the first turbine commences operating, and must be carried out for a duration of at least five years. The duration and timing of the monitoring plan may be altered with the written consent of the responsible authority. The monitoring program must include:
 - i. surveys conducted at an agreed time interval and agreed sampling frequency to ascertain:
 - the species, number, age, sex (if possible) and date of any listed species mortality and any other bat and avifauna species mortality
 - seasonal and yearly variation in the number of listed species mortality and any other bat and avifauna species mortality
 - whether further detailed investigations of any potential impacts on listed species and any other bat and avifauna species mortality are warranted

- ii. procedures for reporting strikes/mortalities of species to the DELWP Environment Portfolio:
 - strikes/mortalities of bird and bat taxa listed as threatened under the *Flora and Fauna Guarantee Act 1988* (FFG Act) and bird and bat taxa listed as threatened or migratory under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) must be reported within 7 days of becoming aware of any strike/mortality
 - strikes/mortalities of raptors and other bat and avifauna species must be reported quarterly
 - iii. procedures for reporting strikes/mortalities of bat and avifauna species other than listed species to the DELWP Environment Portfolio quarterly
 - iv. information on the efficacy of searches for carcasses of species, and, where practicable, information on the rate of removal of carcasses by scavengers so that correction factors can be determined to enable calculations of the likely total number of mortalities
 - v. procedures for the regular removal of any bird or animal carcasses likely to attract raptors to areas near turbines
 - vi. monitoring to determine the impact of the operation of the wind energy facility on the populations of raptors, Forktailed Swift and White-throated Needletail
 - vii. procedures for determining whether further detailed investigations of any potential impacts on native bat and avifauna species are warranted. Any further detailed investigations required are to be undertaken in consultation with the DELWP Environment Portfolio and to the satisfaction of the responsible authority
 - viii. procedures for periodic reporting, within agreed timeframes, of the findings of the monitoring to the DELWP Environment Portfolio. Such reports must be made publicly available on the project website
 - ix. a data sharing agreement with the DELWP Environment Portfolio to provide georeferenced, time stamped, data that is collected as part of the BAM plan.
47. When the monitoring program required under the BAM Plan is complete, the operator must submit a report to the responsible authority and the DELWP Environment Portfolio, setting out the findings of the program. The report must be:
- a. to the satisfaction of the responsible authority and the DELWP Environment Portfolio
 - b. made publicly available on the project website.
48. After considering the information reported under conditions 46.c.ii) and 46.c.iii) or the report submitted under condition 47, and after consulting with the DELWP Environment Portfolio, the responsible authority may direct the operator to conduct further investigation of impacts on listed species. The further investigation must be undertaken by the operator to the satisfaction of the responsible authority and the DELWP Environment Portfolio.

Brolga Monitoring and Compensation Plan

49. The Environmental Management Plan must include a Brolga Monitoring and Compensation Plan. The plan must be prepared in consultation with the DELWP Environment Portfolio to the satisfaction of the responsible authority. Once endorsed, the plan must be placed on the project website for the life of the project.

The plan must:

- a. be implemented for the life of the project
- b. identify the location of potentially at risk Brolga breeding, migration and flocking activities
- c. include recommendations in relation to a mortality rate for Brolga which would trigger the requirement for responsive mitigation measures to be undertaken by the operator.
- d. specify who is accountable for implementing the plan and the monitoring required under the plan
- e. specify the locations of historical and potential Brolga breeding wetlands that will be enhanced ('enhancement site')
- f. include evidence of landholder agreements to participate in the breeding site enhancement project for its duration that will run with the land for the life of the project
- g. include methods of enhancement appropriate to each enhancement site such as restoration of the natural flooding regime and controlled grazing or stock removal
- h. where appropriate, a program of appropriate fox baiting leading up to each breeding season
- i. five-yearly performance targets for each enhancement site and the program as a whole, consistent with the outcomes of the Population Viability Assessment included in the Golden Plains Wind Farm EES, the zero net impact objective (to be amended every five years depending on outcomes), and the data and recommendations in the plan
- j. monitoring and reporting requirements, including public reporting after 1 year, 2 years, 5 years, 10 years, 15 years, 20 years and 25 years from when the plan is approved, on whether the plan is expected to achieve the 25-year zero net impact objective.

50. Implementation of the Brolga Monitoring and Compensation Plan must commence before development starts. Implementation must be to the satisfaction of the responsible authority in consultation with the DELWP Environment Portfolio.

Native vegetation

51. No more than 49.052 hectares of native vegetation is to be removed under this permit.

52. Before any native vegetation is removed under this permit, a Native Vegetation Plan must be prepared in consultation with the DELWP Environment Portfolio, to the satisfaction of the Responsible Authority. When endorsed the plan will form part of this permit.

The Native Vegetation Plan must include:

- a. a final Biodiversity Assessment Report or similar which identifies all losses being approved by this permit and the associated offset requirements, in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI, 2013)
 - b. plans drawn to scale with dimensions that identify:
 - i. native vegetation to be removed
 - ii. any current mapped wetlands as defined in the *Permitted clearing of native vegetation – Biodiversity assessment handbook* (DELWP, 2015) that are present on the site
 - iii. any native vegetation to be retained that is within the permissible micro-siting envelope or ancillary infrastructure
 - iv. the location of any detected threatened flora and fauna species
 - c. measures to be used during construction to protect native vegetation to be retained.
53. To offset the native vegetation removal described in the endorsed Native Vegetation Plan, the permit holder must secure a native vegetation offset in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI, 2013) and *Native vegetation gain scoring manual* (DEPI 2013)
54. Before any native vegetation is removed, evidence that the required offset has been secured must be provided to the satisfaction of the responsible authority in consultation with the DELWP Environment Portfolio. This evidence must be one or both of the following:
- a. a security agreement signed by both parties, to the required standard for the offset site(s), including a management plan detailing the 10-year management actions and ongoing management of the site
 - b. an allocated credit extract(s) from the Native Vegetation Credit Register.
- A copy of the offset evidence will be endorsed by the responsible authority and form part of this permit.
55. In the event that a security agreement is entered into as contemplated in condition 54.a), the applicant must provide the annual offset site report to the responsible authority by the anniversary date of the execution of the offset security agreement for a period of 10 consecutive years. After the tenth year, the wind farm operator must provide a report at the reasonable request of a statutory authority.
56. Within 30 days of endorsement of the offset evidence by the responsible authority, a copy of the endorsed offset evidence must be provided to the DELWP Environment Portfolio. At the conclusion of the Project, offset requirements can be reconciled with the agreement of the Responsible Authority and the DELWP Environment Portfolio.
57. To prevent the spread of weeds and pathogens, all vehicles must be made free of soil, seed and plant material before being taken to the works site and again before being taken from the works site, during and on completion of the project.

58. Any pruning to the canopy or major structural branches of any tree to be retained must be undertaken in accordance with Australian Standard 4347-2007 – Pruning of Amenity Trees.

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

59. The Environmental Management Plan must include a Construction Environmental Management Plan, which must:
- a. include plans prepared in accordance with conditions 44, 60, 61, 62, 67, 68 and 70
 - b. include procedures regarding the removal of temporary works, plant, equipment, buildings and staging areas, and reinstate the affected parts of the site, when construction is complete
 - c. identify known historical heritage places
 - d. include measures to avoid or minimise impacts on historical heritage values
 - e. require any dry stone walls impacted by the construction of the project to be reconstructed under the supervision of a suitably qualified stonemason, to the satisfaction of the responsible authority
 - f. contain an unexpected finds protocol for managing previously unidentified archaeological sites discovered during works.

Blasting

60. If any blasting is proposed to be undertaken on site (other than at the quarry) as part of construction of the wind energy facility, the Construction Environmental Management Plan must include a Blasting Plan. The Blasting Plan must include:
- a. the name and qualification of the person responsible for blasting
 - b. a description of the locations where the explosives will be used, and the locations of every licensed bore on any property with an adjoining boundary within 1 kilometre of the blasting
 - c. a requirement for the identification and assessment of any potentially sensitive site within 1 kilometre of the location of blasting, including the procedure for pre-blast and post-blast qualitative measurement or monitoring at such sites
 - d. the procedure for site clearance and post blast reoccupation
 - e. the procedure for the storage and handling of explosives
 - f. a requirement that blasting only occur at least 48 hours after notification in writing of the intention to undertake blasting has been given to the occupants of the properties which are located in whole or in part within 1 kilometre of the location of the proposed blasting
 - g. a requirement that blasting only be undertaken between the hours of 8am and 4pm.

For the purposes of this condition, a 'sensitive site' means any land within 10 metres of a residence, hospital, school, or other premises in which people could reasonably expect to be free from undue annoyance and nuisance caused by blasting.

Construction Noise and Vibration Management Plan

61. The Construction Environmental Management Plan must include a Construction Noise and Vibration Management Plan. The Noise and Vibration Management Plan must:
- a. address the effects of construction noise and vibration related to on-site activities and off-site traffic movements
 - b. provide a clear overview of the proposed construction program and demonstrate how the proposed mitigation measures are compliant with the requirements defined by the *Victorian Noise Control Guidelines* (EPA Publication 1254) and include a schedule of noise emission data for the major plant items selected for construction of the Project, and a comparison of the data with the noise emission ranges set out in *AS 2436:2010: Guide to noise and vibration control on construction, demolition and maintenance sites*
 - c. clearly define all unavoidable works and low-noise managed-impact works which may occur outside of normal working hours, such as out of hours deliveries or turbine installation activities that are subject to weather constraints
 - d. describe the proposed scheduling of any out of normal working hours works, and provide evidence that low-noise managed-impact works meet the criteria defined in EPA Publication 1254.

Sediment, Erosion and Water Quality Management Plan

62. The Construction Environmental Management Plan must include a Sediment, Erosion and Water Quality Management Plan that addresses the requirements of the *SEPP (Waters of Victoria)*, *SEPP (Groundwaters of Victoria)*, EPA Publication 275: *Construction Techniques for Sediment Pollution Control* and EPA Publication 480: *Environmental Guidelines for Major Construction Sites*. The Sediment, Erosion and Water Quality Management Plan must be developed in consultation with the Corangamite CMA and the DELWP Environment Portfolio, and approved by the responsible authority before development starts.
63. The Sediment, Erosion and Water Quality Management Plan will contain:
- a. details of sediment and erosion control measures to be implemented prior to commencing ground disturbance works and throughout construction
 - b. details of the sediment control measures to treat and manage runoff from the terminal station during construction and operation of the development
 - c. a monitoring program (including, as a minimum, visual monitoring during construction activities) and monitoring of sediment management measures developed under condition 63(b)
 - d. a complaint investigation and response plan.
64. All hydrocarbons and hazardous substances must be stored in facilities designed in accordance with EPA Publication 347: *Bunding Guidelines* and AS1940:2004.
65. In the event that wastewater is to be treated on site, an on-site wastewater treatment and disposal system is to be selected, sited and installed in accordance with the EPA

Publication 891: *Code of practice – onsite wastewater management* to the satisfaction of the responsible authority.

66. Access routes are to be designed to maintain access to turbines and associated infrastructure with flood depths below 300 mm during construction and maintenance operations.

Salinity Assessment Report and Management Plan

67. The Construction Environmental Management Plan must include a Salinity Assessment Report and Management Plan, which must be prepared in consultation with the DELWP Environment Portfolio. The Salinity Assessment Report and Management Plan must confirm site specific salinity levels in areas within the Salinity Management Overlay, and specify the construction and management measures designed to minimise the salinity risks, including:
- a. geotechnical investigations (including subsurface material salinity levels) at appropriate intervals to understand and determine site specific conditions for the design and durability of infrastructure within the Salinity Management Overlay
 - b. recommendations relating to appropriate building specification and site management recommendations within the Salinity Management Overlay.

Hazardous Substances Management Plan

68. The Construction Environmental Management Plan must include a Hazardous Substances Management Plan that has been prepared in accordance with:
- a. EPA Publication 480: *Environmental Guidelines for Major Construction Sites*
 - b. EPA 628: *Guidelines for the Concrete Batching Industry* (1998)
 - c. EPA Publication 347: *Bunding Guidelines*
 - d. AS 1940:2004 – *Storage and handling of flammable combustible liquids*.
69. The Hazardous Substances Management Plan must include, as a minimum:
- a. details of spill control and bunding measures to control and contain spills, minimise the amount of fuels and chemicals stored on site, and contingency plans to clean-up or manage spills
 - b. a monitoring program (including at least visual monitoring to enable early detection of leaks and spills and regular assessment of the integrity of bunding)
 - c. a complaint investigation and response plan.

Air Quality Management Plan

70. The Construction Environmental Management Plan must include an Air Quality Management Plan that addresses the requirements of the *SEPP (Air Quality Management)* and contains:
- a. measures to minimise generation of dust and other air emissions
 - b. a monitoring program (including a minimum visual monitoring during construction activities)

c. a complaint investigation and response plan.

71. All temporary concrete batching plants are to be designed and operated in accordance with the EPA Publication 628: *Environmental Guidelines for the Concrete Batching Industry* to minimise dust and other emissions.

EMERGENCY RESPONSE PLAN

72. Before development starts, an Emergency Response Plan must be submitted to, approved and endorsed by the responsible authority. The Emergency Response Plan must be prepared in consultation with the CFA and Rural Ambulance Victoria. Once endorsed, the plan must be placed on the project website for the life of the project.

The Emergency Response Plan must:

- a. outline measures to provide for adequate fire-fighting access within the wind farm when required, including provision for land-based fire-fighting and aerial fire-fighting operations where appropriate
- b. be generally in accordance with the '*Emergency Management Guidelines for Wind Farms*' (Country Fire Authority, August 2017), except that passing bays on access tracks are not required.

AVIATION

73. Prior to turbines GP 227, GP 231 and GP 229 being constructed, an aircraft safety assessment prepared by a suitably qualified person must be submitted which demonstrates that the existing operations conducted from the airstrip at 1944 Wingeel Road, Barunah Park will be able to continue safely without significant impact from the turbines, to the satisfaction of the responsible authority, unless an alternative arrangement is agreed between the parties to the satisfaction of the responsible authority.

74. Copies of the development plans endorsed under condition 1 must be provided to the following entities within 30 days after being endorsed:

- a. CASA
- b. the Department of Defence (RAAF Aeronautical Information Service)
- c. Airservices Australia
- d. any aerodrome operator within 30 kilometres of the external property boundaries of the site
- e. flying training organisations at Ballarat, Bacchus Marsh, Point Cook and Lethbridge aerodromes
- f. the Aerial Agricultural Association of Australasia
- g. any organisation responsible for providing aerial fire-fighting, air ambulance and search and rescue in the area (eg Victoria Police Air Wing, Country Fire Authority, Rural Ambulance Victoria)
- h. local aerial agricultural application operators.

75. The notification required under condition 74.a) to 74.c) must utilise the procedure and form referred to in Civil Aviation Safety Authority Advisory Circular AC 139-08 (v2.) *Reporting of tall structures and hazardous plume sources* dated March 2018.
76. Obstacle marking on meteorological masts is to be provided in accordance with Section 39 of the (NASF) Guideline D.
77. Before development, starts an Aviation Impact Statement based upon the approved detailed design is to be provided to Airservices Australia and the Department of Defence (RAAF Aeronautical Information Service).

SOCIAL AND COMMUNITY

Community and Stakeholder Engagement Plan

78. Before development starts, a Community and Stakeholder Engagement Plan must be developed and implemented to the satisfaction of the responsible authority. Once endorsed, the Community and Stakeholder Engagement Plan will form part of this permit, and must be made publicly available on the project website, and remain publicly available for the life of the project.

The Plan must outline the objectives, tools, timing and the desired outcomes for the community and stakeholder engagement to be carried out through the detailed design, construction and operation of the Project.

The objectives of this plan are to:

- a. deliver effective stakeholder engagement and consultation through the detailed design, construction and operation of the project
- b. ensure all affected stakeholders and interested parties are informed, consulted and involved and their values, priorities and issues are acknowledged and addressed
- c. provide timely, consistent, and open engagement with stakeholders throughout the detailed design, construction and operation of the project.

Workforce Accommodation Strategy

79. Before development starts, a Workforce Accommodation Strategy is to be developed and implemented for the construction and decommissioning workforce to the satisfaction of the responsible authority. The aim of the accommodation strategy will be to reduce the likelihood of displacement of existing residents in Rokewood and the surrounding area during the construction and decommissioning of the wind energy facility.

CORANGAMITE CATCHMENT MANAGEMENT AUTHORITY CONDITIONS

80. Turbine foundations must not be located within 100 metres of the centre-line of the Mt Misery, Kuruc-a-ruc, Ferrers and Mia Creeks, as depicted on the Corangamite Catchment Management Authority's Designated Waterways layer as at the date of this permit.
81. Unless otherwise approved in writing by the Corangamite Catchment Management Authority, turbine foundations must not be located within 30 metres of the centre-line of any other designated waterway, as depicted on the Corangamite CMA's Designated Waterways layer as at the date of this permit.

82. Any works carried out within a designated waterway and Flood Risk Area must be designed and carried out so as to ensure, to the satisfaction of the responsible authority that the works will not result in any adverse hydrologic or hydraulic impacts to land, assets or infrastructure outside the external boundary of the wind farm site. In this condition, a 'Flood Risk Area' is a location within the mapped 1% AEP flood depths locations as depicted in Figures 6-7, 6-9 and 6-11 of the report prepared by Water Technology titled Surface Water Assessment Golden Plains Wind Farm and dated February 2018.
83. All works must be designed and carried out so as to ensure, to the satisfaction of the responsible authority and Corangamite CMA, that:
- a. there is no loss of floodplain storage arising from works carried out on the Golden Plains Wind Farm site
 - b. the placement of any fill within the 1% AEP flood fringe (depths at or less than 300mm) and/or 1% AEP active flood plain is carried out in accordance with cut-and-fill plans and specifications that have been approved in writing by the Corangamite CMA. The active flood plain is defined in terms of the depth and velocity of water over the area in question during a 1% AEP flood event as follows:
 - i. depth greater than or equal to 0.3 metres; and
 - ii. velocity greater than or equal to 3.0 m/s; and
 - iii. the product of depth multiplied by velocity greater than or equal to 0.3m² per second
 - c. there is no material change to the overland flow regimes (including flow rates and volumes of flows) outside the external boundary of the wind farm site.

AUSNET TRANSMISSION GROUP CONDITIONS

84. Any wind turbine proposed for construction within 200 metres of AusNet Transmission Group's easement will be assessed by AusNet Services (subject to assessments being funded by the operator) and, where possible, alternative suitable locations agreed, and no anemometry masts shall be constructed within 100 metres of the easement.
85. No buildings or structures are permitted on AusNet Transmission Group's easement other than interface works required for connection of the wind farm electrical system to the 500 kilovolt transmission line. Design plans for such work must be submitted to and approved in writing by AusNet Transmission Group prior to the commencement of construction.
86. Details of any road or track construction and the installation of services within the easement must be submitted to AusNet Transmission Group and approved in writing prior to the commencement of work on site.
87. Gates must be installed in any new boundary fences that cross the easement to enable access by AusNet Transmission Group vehicles.
88. Natural ground surface levels on the easement must not be altered by the stockpiling of excavated material or by landscaping without prior written approval from AusNet Transmission Group.

89. A 'Permit to Work Adjacent to Exposed High Voltage Electrical Apparatus' must be obtained prior to the commencement of any works on the easement that involves the use of any plant or equipment exceeding 3 metres operating height.
90. Parking, loading, unloading and load adjustment of large commercial vehicles is not permitted on the easement.
91. All future works in the easement must be submitted to AusNet Transmission Group and approved in writing prior to the commencement of work on site.

COMPLAINTS

Complaint Investigation and Response Plan

92. Before development starts, a Complaint Investigation and Response Plan must be submitted to, approved and endorsed by the responsible authority.

The Complaint Investigation and Response Plan must:

- a. respond to all aspects of the construction and operation of the wind farm
 - b. be prepared in accordance with AS/NZS 10002:2014 *Guidelines for complaint management in organisations*
 - c. include a process to investigate and resolve complaints (different processes may be required for different types of complaints).
93. The Complaint Investigation and Response Plan must be implemented to the satisfaction of the responsible authority. The endorsed Complaint Investigation and Response Plan must not be altered or modified without the written consent of the responsible authority.

Publish information about complaints

94. The operator must publish the following information on the project website:
 - a. a copy of the endorsed Complaints Investigation and Response Plan
 - b. a toll free telephone number and email contact for complaints and queries to the operator.

Complaints register

95. Before development starts, a Complaints Register must be established which records:
 - a. the complainant's name and address (if provided), including (for noise complaints) any applicable property reference number contained in the Noise and Vibration Assessment contained in Technical Appendix N1 to the Golden Plains Wind Farm EES
 - b. a receipt number for each complaint, which must be communicated to the complainant
 - c. the time and date of the incident, and the prevailing weather and operational conditions at the time of the incident
 - d. a description of the complainant's concerns, including (for a noise complaint) the potential occurrence of special audible characteristics

- e. the process for investigating the complaint, and the outcome of the investigation, including:
 - i. the actions taken to resolve the complaint
 - ii. for noise complaints, the findings and recommendations of an investigation report undertaken in accordance with the endorsed Noise Management Plan.

96. All complaints received must be recorded in the Complaints Register.

97. A complete copy of the Complaints Register, along with a reference map of complaint locations must be provided to the responsible authority on each anniversary of the date of this permit, and at other times on request.

DECOMMISSIONING

General requirements

98. The following requirements must be met when a turbine(s) permanently ceases operation:

- a. the responsible authority must be notified within two (2) months after the turbine(s) permanently ceases operation
- b. prior to commencing decommissioning works, a decommissioning traffic management plan specifying measures to manage traffic impacts associated with removing the turbine(s) and associated infrastructure from the site, must be submitted to the satisfaction of the responsible authority
- c. all infrastructure, plant, equipment and access tracks that are no longer required for the on-going use or decommissioning of the facility must be removed, although turbine foundations, access tracks and hardstand areas may remain with the consent of the landowner
- d. reinstatement of the site, or the relevant part of the site, to the condition it was in prior to the commencement of development must occur to the satisfaction of the responsible authority.

Decommissioning Noise and Vibration Management Plan

99. Before decommissioning of the wind farm starts, a Decommissioning Noise and Vibration Management Plan is to be submitted to, approved and endorsed by the responsible authority.

100. The Decommissioning Noise and Vibration Management Plan is to:

- a. address the effects of decommissioning noise and vibration related to on-site activities and off-site traffic movements
- b. provide a clear overview of the proposed decommissioning program and demonstrate how the proposed mitigation measures are compliant with the requirements defined by the *Victorian Noise Control Guidelines* (EPA Publication 1254)
- c. include a schedule of noise emission data for the major plant items selected for decommissioning of the project, and a comparison of the data with the noise emission ranges set out in AS 2436:2010: *Guide to noise and vibration control on construction, demolition and maintenance sites*

- d. clearly define all unavoidable works and low-noise managed-impact works which may occur outside of normal working hours, such as out of hours removals or decommissioning activities that are subject to weather constraints
- e. describe the proposed scheduling of any out of hours works and provide evidence to show that low noise managed-impact works meet the criteria defined in EPA Publication 1254.

EXPIRY

101. This permit will expire if one of the following applies:

- a. the development is not started within six (6) years of the date of this permit
- b. the development is not completed within twelve (12) years of the date of this permit.

PERMIT NOTE

Any works to occur on, over or under a designated waterway are to be undertaken in accordance with a Works on Waterways Permit provided by the relevant catchment management authority under the provisions of section 67 of the *Water Act 1989*.

Surfacewater and groundwater must not be taken for commercial use without a licence from the relevant catchment management authority under section 51 of the *Water Act 1989*.

A permit will be required to remove protected flora under the *Flora and Fauna Guarantee Act 1988* from public land, including roadsides.

Wildlife management authorisation under the *Wildlife Act 1975* will be require for the taking and/or handling of any wildlife during the construction, operation and decommissioning stages of the project.