

ENVIRONMENT EFFECTS ACT 1978

RYAN CORNER WIND FARM

ASSESSMENT

May 2008

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1 INTRODUCTION

1.1 Purpose of this document

On 22 July 2005, the Minister for Planning determined that the proposed Ryan Corner Wind Farm requires assessment under the *Environment Effects Act 1978* (EE Act), beginning with the preparation of an Environment Effects Statement (EES).

This document is the Minister's Assessment under the EE Act. It provides the Minister for Planning's findings and recommendations with respect to the environmental effects of the Ryan Corner Wind Farm. The Assessment will be taken into account in decisions under the *Planning and Environment Act 1978* (P&E Act) for the relevant planning permit application (20060222).

1.2 Project description

TME Australia Pty Ltd (TME) is the proponent for the Ryan Corner Wind Farm, a wind energy facility of up to 68 wind turbine generators with a total rated capacity of up to 136 megawatts (MW). It is estimated that the wind farm would generate up to 357,400 MWh of electricity per year.

The preliminary wind farm design is based on the Gamesa Eolica G87-2.0 MW turbine. It is proposed to mount each turbine on a steel tower with a hub height of 78 metres. The nacelle on top of the tower would house the mechanical and electrical components (including gearbox, generator, brakes, wiring and hydraulic/lubricating systems). A three-bladed rotor, with a diameter of 87 metres, would be mounted at the front of the nacelle. The overall height of the turbine structure would be approximately 121.5 metres to the zenith of the rotor blade. Access to each turbine would be provided by a network of unsealed tracks, which would initially be 5 to 7 metres wide in order to accommodate construction vehicles. Once construction is completed, the tracks would be reduced in width to about 2 to 3 metres to provide access for maintenance vehicles during the operational life of the wind farm.

It is proposed to link each turbine to an on-site substation by an underground cable network (with two overhead cable crossings of Riverside/Harris Road). The electricity generated by the Ryan Corner Wind Farm would be transferred to the electricity grid via an overhead 132 kV power line from the on-site substation to a high voltage substation at the site proposed for the Hawkesdale Wind Farm¹ (about 25 km north east of the Ryan Corner site). The route length of the proposed power line is about 32 km.

The key activities involved in development of the Ryan Corner Wind Farm are:

- Site clearing.
- Establishing site compound and lay down areas.
- Transport of equipment, materials and staff.
- Earthworks for tracks, foundations and underground cables.

¹ TME is also the proponent for the Hawkesdale Wind Farm. A separate planning permit application has been lodged with the Minister for Planning for this wind farm.

- Turbine foundation works.
- Erection of tower and turbine structures, using a large mobile crane.
- Construction of building infrastructure, including substation and control room.
- Installation of electrical infrastructure.
- Site restoration following commissioning of the wind farm.

Chapter 4 of the EES provides a more detailed description of the main components of the project.

1.3 Project setting

The site for the Ryan Corner Wind Farm covers an area of about 3,600 hectares of mainly cleared farming land, about 12 km north-west of Port Fairy in Moyne Shire. The site is generally bounded by the Port Fairy – Hamilton Road, Fingerboard Road and Shaw River. It is dissected by Riverside Road and Harris Road.

The development footprint for the wind farm would be about one per cent of the 12 rural holdings making up the project site.

The site contains a series of stony rises that are a feature of the Western District volcanic plains. Ritchies Creek and Shaw River cross the site before flowing southward into Lake Yambuk. The site also contains several ephemeral wetlands (including a large wetland known as Island Swamp) and a permanent water body (known as Duck Hole).

The site's vegetation largely consists of pasture grasses with little over-storey vegetation. Relatively intact native vegetation occurs within and adjoining the Riverside Road reserve. Patches of remnant native vegetation also occur on the ridges in the south-eastern part of the site and around the ephemeral wetlands. The remnant native vegetation has generally been highly modified by the long history of grazing on the site.

The surrounding area is predominantly used for stock grazing. Other nearby land uses include blue gum plantations, quarrying, a chicken farm and holiday accommodation.

The nearest towns are Yambuk (3km to the west), Port Fairy (12 km to the southeast) and Kirkstall (15 km to the east).

1.4 Structure of this Assessment

Chapter 2 of this document outlines the EES process for the Ryan Corner Wind Farm, while Chapter 3 describes the main considerations bearing on the Assessment, including the evaluation objectives, which reflect relevant legislation and policy.

The main part of this Assessment is found in Chapter 4, which provides the Minister's assessment of the environmental effects of the Ryan Corner Wind Farm within the framework of an integrated set of evaluation objectives.

Chapter 5 provides a response to the key recommendations of the Inquiry.

2 STATUTORY PROCESSES

2.1 Environment Effects Statement

On 22 July 2005, the Minister for Planning determined that the project requires an Environment Effects Statement (EES) under the *Environment Effects Act 1978*. An EES was required because:

- The site contains areas of Stony Knoll Shrubland Ecological Vegetation Class, which is endangered in Victoria and provides important habitat for a number of threatened species, including the Stripped Legless Lizard.
- There is a high likelihood of movements by threatened avifauna species between the wetlands on site, the adjacent Lake Aringa and Lake Yambuk (7 km south west of the site).
- The site is located 6 km from the coast and within 7 km of the existing Codrington and Yambuk wind energy facilities, raising the potential for significant cumulative impacts.
- There is a high probability of Aboriginal cultural heritage occurring on the site due to its landscape features and the past occupation of the area by Aboriginal people.
- An EES process would allow for a rigorous assessment of the above matters as well as potential cumulative landscape and biodiversity impacts.

Assessment Guidelines, specifying the range of matters to be addressed in the EES, were issued in December 2005.

The EES was prepared by TME and its consultants and then placed on exhibition from 10 February to 23 March 2007. Fourteen submissions were received as a result of the public notice for the EES. Of these submissions, five opposed the proposed Ryan Corner Wind Farm and two (from Moyne Shire Council and Sustainability Victoria) supported the proposal. The remaining submissions from government agencies raised no objections but requested specific conditions be attached to any permit that may be granted.

On 3 May 2007, the Minister for Planning appointed three persons (Mr Nicholas Wimbush, Mr Christopher Banon and Dr Leon Collett²) to conduct an inquiry under the *Environment Effects Act 1978*.

The Inquiry held a directions hearing on 2 July 2006. Public hearings were held from 6 to 9 August 2007.

The Inquiry reconvened on 25 September 2007 after it was discovered that the Civil Aviation Safety Authority had changed its position on the need for aviation obstacle lighting at the Ryan Corner Wind Farm. The Inquiry subsequently directed the proponent to provide further public notice in relation to this matter. One submission was received in response to the notice.

² Dr Collett passed away after the Inquiry hearings. The Minister for Planning confirmed that the remaining members of the Inquiry should complete the report on the Ryan Corner Wind Farm.

The Inquiry provided its report to the Minister for Planning on 11 March 2008. The next step under the *Environment Effects Act* is for the Minister for Planning to provide an Assessment of the environmental effects of the Ryan Corner Wind Farm to decision-makers under Victorian law. The decision-makers must then consider the Assessment before deciding whether to allow the proposal to proceed.

2.2 Statutory approvals

The Ryan Corner Wind Farm proposal requires a number of statutory approvals, including the following:

- A permit for the use and development of the site as a wind energy facility under the *Planning and Environment Act 1987*.
- A permit to clear native vegetation on the site under the *Planning and Environment Act 1987*.
- Approval of a cultural heritage management plan under the *Aboriginal Heritage Act 2006*.

Planning Permit Application 20060222 for the wind energy facility was lodged with the Minister for Planning on 31 October 2006. This application was exhibited concurrently with the EES.

On 26 February 2007, TME lodged Planning Permit Application PL07/067 for the removal of native vegetation on the wind farm site with Moyne Shire Council. On 30 March the Council gave notice of the application to adjoining owners/occupiers. At the request of the Council, the Minister decided on 23 May 2007 to “call in” the application under section 97C of the *Planning and Environment Act 1987*.

The Minister appointed the same three inquiry members as a panel to consider Planning Permit Applications 20060222 and PL07/067 under sections 97E, 153 and 155 of the *Planning and Environment Act 1987*.

3 ASSESSMENT CONTEXT

In determining whether, and on what basis, the proposed Ryan Corner Wind Farm should proceed, this Assessment takes account of relevant legislation and policy, including the Moyne Planning Scheme, which together form the context against which the environmental effects of this proposal need to be evaluated.

Under section 4(1) of the *Planning and Environment Act 1987*, the objectives for planning in Victoria are:

- (a) to provide for the fair, orderly, economic and sustainable use and development of land;
- (b) to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity;
- (c) to secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria;
- (d) 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;
- (e) to protect public utilities and other assets and enable the orderly provision and coordination of public utilities and other facilities for the benefit of the community;
- (f) to facilitate development in accordance with the objectives set out in paragraphs (a), (b), (c), (d) and (e);
- (g) to balance the present and future interests of all Victorians.

Section 4(2) sets objectives for the planning framework established by the Act, including “(d) to ensure that the effects on the environment are considered and provide for explicit consideration of economic and social effects when decisions are made about the use and development of land”.

The State Planning Policy Framework (SPPF), which is part of the Moyne Planning Scheme, sets State-level policy for planning and for considering development proposals. Clause 11 of the SPPF incorporates an overall goal of integrating environmental, social and economic factors in the interests of net community benefit and sustainable development.

Specific clauses in the SPPF that are relevant to the assessment of the Ryan Corner Wind Farm include:

- Protection of catchments, waterways and groundwater (clause 15.01);
- Air quality (clause 15.04);
- Noise abatement (clause 15.05);
- Protection from wildfire (clause 15.07);
- Coastal areas (clause 15.08);
- Conservation of native flora and fauna (clause 15.09);
- Heritage (clause 15.11);
- Renewable energy (15.14)
- Tourism (clause 17.04);
- Agriculture (clause 17.05);
- Airfields (clause 18.04).

The local policy framework and other provisions in the Moyne Planning Scheme must also be considered. The local policies of particular relevance are:

- Aboriginal heritage clause (22.02.1);
- Rare and threatened species (clause 22.02-2);
- Hilltop and ridgeline protection (clause 22.02-7);
- Flora and fauna (clause 22.02-8);
- Agricultural production (clause 22.03-4);
- Fire protection (clause 22.03-8).

Clause 52.32 of the Moyne Planning Scheme specifies the decision guidelines for a wind energy facility, which cover a broad range of environmental effects. These refer specifically to the *Policy and planning guidelines for development of wind energy facilities in Victoria* (2003). This is a key policy document outlining how the Victorian Government will facilitate the appropriate development of wind energy facilities, balancing environmental, social and economic outcomes.

In addition, a range of other State and national legislation, policies and strategies provide critical context for this assessment of environmental effects for the Ryan Corner Wind Farm in relation to greenhouse, biodiversity, cultural heritage, noise, air quality, water quality and water management. Of particular relevance are the following policies and strategies:

- *The Greenhouse Challenge for Energy – Driving investment, creating jobs and reducing emissions* (2004) provides the Victorian Government policy position on reducing greenhouse gas emissions from the stationary energy sector.
- *Our Environment, Our Future - Sustainability Action Statement* (2006) outlines Victorian Government actions to support a sustainable energy supply system in Victoria, including the introduction of the Victorian Renewable Energy Target.
- *Victoria's Biodiversity – Directions in Management* (1997), which was prepared under the *Flora and Fauna Guarantee Act 1988*, provides a framework for responding to biodiversity challenges in different bioregions.
- *Victoria's Native Vegetation Management – A Framework for Action* (2002) gives effect to the native vegetation goals of *Victoria's Biodiversity Strategy*, as well as reflecting Victoria's commitments to national policies.
- *State Environment Protection Policy (Waters of Victoria)* provides the legislative framework for the protection of beneficial uses and the objectives for the protection of these uses.
- *Glenelg Hopkins Regional Catchment Strategy 2003-2007* provides a framework for managing land, water and biodiversity assets in the catchment. It is the overarching strategic document for specific regional action plans such as the River Health Strategy and the Salinity Plan.

In light of the legislative and policy framework that applies to the Ryan Corner Wind Farm as well as the potential effects and risks, a set of evaluation objectives have been formulated to guide an integrated assessment of the project. These objectives were included in the Assessment Guidelines for the EES and are reproduced below:

- (1) *To contribute to government policy objectives to maintain a secure, efficient and affordable supply of energy in Victoria while reducing the intensity of greenhouse gas emissions from the energy sector.*

This evaluation objective reflects the Victorian Government's broad policy objectives stated in *The Greenhouse Challenge for Energy – Driving investment, creating jobs and reducing emissions* (2004). Both the *National Greenhouse Strategy 1998* and *Victorian Greenhouse Strategy 2002* recognise the important role of renewable energy as a component of a strategic framework for tackling the enhanced greenhouse effect. The evaluation objective also reflects the more specific policies stated in clause 15.14 of the SPPF (Renewable Energy) and *Policy and planning guidelines for development of wind energy facilities in Victoria* (2002). The latter document stresses that, in decisions on applications for wind energy facilities, considerable weight should be given to the Victorian Government's objectives on developing renewable energy.

- (2) *To minimise the adverse impacts of the facility on visual landscape values, particularly along sections of the coast of high sensitivity for public recreation and tourism.*

This objective reflects the objectives of SPPF clause 15.08 (Coastal areas), the *Victorian Coastal Strategy* (2002) and supporting coastal planning documents. It also reflects the policy of protecting areas of environmental and visual significance stated in clause 22.02-7 (Hilltop and ridgeline protection) in the Moyne Planning Scheme.

- (3) *To ensure that the construction and operation of the facility does not unduly affect the amenity of nearby dwellings.*

This evaluation objective reflects the objectives of planning under the *Planning and Environment Act 1987* and the principles set out in clause 11.03 of the SPPF.

- (4) *To avoid or minimise impacts on species and communities listed under the Flora and Fauna Guarantee Act 1988 to the greatest extent practicable, to avoid or minimise impacts on other indigenous species and communities, and to comply with net gain requirements for biodiversity outcomes.*

This objective reflects clause 15.09 of the SPPF and the goals for biodiversity management set out in *Victoria's Biodiversity Strategy 1997* (which was prepared under the *Flora and Fauna Guarantee Act 1988*). It also reflects the more detailed provisions in *Victoria's Native Vegetation Management – A Framework for Action* (2002).

- (5) *To avoid or minimise impacts on places with Aboriginal and non-Aboriginal cultural heritage values, to the greatest extent practicable.*

This objective reflects the objectives of clauses 15.11 (Heritage) and 22.02-1 (Aboriginal heritage) of the Moyne Planning Scheme and the intent of the *Aboriginal Heritage Act* (2006) and the *Heritage Act* 1995.

- (6) *To minimise any physical impacts from the construction and operation of the facility, such as erosion, sedimentation, road damage and traffic hazards.*

This objective reflects the objectives of clauses 15.01 of the Moyne Planning Scheme, the *Glenelg Hopkins Regional Catchment Strategy 2003 to 2007* and relevant SEPPs under the *Environment Protection Act 1970*.

- (7) *Overall, to provide a clear societal benefit, taking account of economic benefits, social outcomes and residual environmental impacts.*

This objective derives from the objectives of planning in the *Planning and Environment Act 1987*. It also accords with the principle of balancing conflicting objectives in favour of net community benefit and sustainable development as stated in clause 11 of the SPPF.

4 INTEGRATED ASSESSMENT

4.1 Greenhouse

Objective: To contribute to government policy objectives to maintain a secure, efficient and affordable supply of energy in Victoria while reducing the intensity of greenhouse gas emissions from the energy sector.

The EES estimates that the Ryan Corner Wind Farm would generate 357,400 MWh of electricity per annum, based on a conservative capacity factor of 30 per cent. This output would be sufficient to meet the power requirements of about 67,000 households in Victoria. The annual greenhouse gas savings from this renewable energy source would displace 332,389 tonnes of carbon dioxide equivalent³.

In 2006, the Victorian Government passed legislation to lift Victoria's levels of renewable energy generation from the current 4 per cent to 10 per cent by 2016, through the Victorian Renewable Energy Target (VRET). Under VRET, electricity retailers are required to purchase an additional 3,275 gigawatt-hours (GWh) of renewable energy by 2016. This will result in more than 1000 megawatts of renewable energy generation capacity being installed, while reducing greenhouse gas emissions by more than 2.5 million tonnes per year.

The Ryan Corner Wind Farm would contribute about 11 per cent to meeting VRET. It would accord with the objectives and actions in *Our Environment, Our Future - Sustainability Action Statement* (2006) and the *Victorian Greenhouse Strategy* (2002).

I note that the Inquiry has found that the Ryan Corner Wind Farm would have a net positive effect on greenhouse gas emissions and is thus consistent with applicable policy.

It is my assessment that the Ryan Corner Wind Farm would make an important contribution to the Victorian Government's efforts to maintain a secure, efficient and affordable supply of energy in Victoria while reducing the intensity of greenhouse gas emissions from the energy sector.

4.2 Landscape

Objective: To minimise the adverse impacts of the facility on visual landscape values, particularly along sections of the coast of high sensitivity for public recreation and tourism.

This section of the Assessment considers the effect of the Ryan Corner Wind Farm on the broad landscape values within the project's viewshed. The effects on the visual amenity of nearby dwellings is considered in section 4.3 of this Assessment. The cumulative effects of the Ryan Corner Wind Farm, in combination with the existing

³ This estimate is based on McLennan Magasanik Associates Pty Ltd (2006) *Assessment of Greenhouse Gas Abatement from Wind Farms in Victoria* report to Sustainability Victoria.

and proposed wind farms in the vicinity, on both broad landscape values and the amenity of individual dwellings are considered in section 4.7.

Chapter 20 of the EES provides a detailed description of the methodology applied by Environmental Resources Management Australia (ERM) in investigating the potential visual effects of the Ryan Corner Wind Farm. These investigations covered an area within 15 km of the wind farm site. Beyond this distance the visual effect of the wind turbines would be regarded by ERM as insignificant. The visual sensitivities of the various landscape units within the viewshed have been rated by ERM. This rating varies from medium - high for coastal dunes and reserves down to a low rating for the rural plains (because of modified nature of such landscapes).

The significance of the landscape effect of the wind farm was assessed from representative viewpoints along the coast, the Princes Highway and local roads, based on a combination of factors including: the visual sensitivity of the landscape unit; the distance to the proposed wind farm; and the levels of visitation to the viewpoint.

Since the southern boundary of the site is about 5 km from the coast, the visual effects of the proposed wind farm on coastal landscape values are of some importance. The *Coastal Spaces Landscape Assessment Study*⁴ has examined the coastal region from Warrnambool to the South Australian border. The study has assigned a rating of regional significance to the coastal strip between Port Fairy and Yambuk. The Ryan Corner site is well beyond this regionally significant coastal landscape.

The EES found that the wind farm would not be visible from The Craggs and Lake Yambuk lookouts, which are within the coastal strip. It is therefore concluded that the proposed Ryan Corner Wind Farm would not significantly affect coastal landscape values.

The landscape effects from other viewpoints along the highway and other local roads were assessed as having low significance.

The Inquiry generally supports the landscape assessment approach adopted by ERM and finds that the overall visual impact of the wind farm on the regional landscape is low.

After taking into account the Inquiry's analysis, it is my assessment that the potential effects of the Ryan Corner Wind Farm on areas with significant landscape values are likely to be low.

4.3 Amenity

Objective: To ensure that the construction and operation of the facility does not unduly affect the amenity of nearby dwellings.

⁴ Department of Sustainability and Environment (2006) *Coastal Spaces Landscape Assessment Study – Protection and Management of Victoria's Coastal Landscapes – State Overview Report*

The Ryan Corner Wind Farm could have a number of effects on the amenity of the local community. These effects include:

- noise generated by wind turbines;
- effects on views from dwellings;
- shadow flicker;
- electromagnetic interference.

These potential effects are assessed below.

Noise

The EES investigations included monitoring of background noise levels at five houses in the vicinity of the wind farm site. These locations were considered representative for background noise conditions for 23 dwellings in the vicinity of the wind farm; of these, seven are owned by farmers who are beneficiaries of the wind farm project. The nearest non-stakeholder⁵ dwelling is about 1 km from the closest turbine.

Noise modelling has been undertaken in accordance with the *New Zealand Standard for Acoustics: The Assessment and Measurement of Sound from Wind Turbine Generators (NZS 6808:1998)*. It was found that predicted noise levels at all but three of the dwellings would easily comply with the acceptable limit⁶ recommended by the standard. These three dwellings are owned by landholders who are beneficiaries of the wind farm.

The Inquiry has concluded that the noise from the Ryan Corner Wind Farm will not result in unacceptable environmental impact on surrounding properties and has endorsed draft conditions for the planning permit⁷.

It is my assessment, having regard to the Inquiry's conclusions, that the application of NZS 6808 would ensure that the amenity of dwellings would not be unduly affected by noise generated by the Ryan Corner Wind Farm provided that:

- once the full facility is operational, an independent acoustic expert undertakes an analysis of wind farm noise levels at nearby dwellings to confirm compliance in relation to NZS 6808;
- a 5 dBA penalty is applied in the event of annoying tonal variations, cyclic beats or other special audible characteristics being detected;
- the night-time period is separately considered from daytime background noise periods in order to give greater emphasis to avoidance of sleep disturbance.

It is further my assessment that TME should prepare a noise complaint and evaluation plan to provide for the possible occurrence of special noise characteristics during stable atmospheric conditions at night time. The plan should include procedures for investigating the frequency of possible sleep disturbance and providing a suitable operational response.

⁵ Non-stakeholders are people living near the wind farm site that do not have a lease agreement with TME Australia for the location of wind turbines on their land.

⁶ NZS 6808:1998 recommends that the noise level from a wind farm at a residential site should not exceed the background level (L_{A95}) by more than 5 dB(A) above the existing background level, whichever is the greater.

⁷ During the hearings, the Inquiry asked the Department of Planning and Community Development to prepare draft conditions for a planning permit for discussion purposes. These conditions are set out in Appendix B of the Inquiry report.

Visual amenity

The EES includes an analysis of the visual effects of the proposed wind farm on dwellings in close proximity to the site. According to the EES, there are 14 non-stakeholder dwellings within 1.5 km of the wind farm and a further 22 houses between 1.5 km and 3 km of the wind farm. The EES uses seven representative dwellings with different orientations to the wind farm to illustrate the potential effects on views from local dwellings. In the EES the visual impacts from the various viewpoints were rated as low, medium or high, the critical factor being the amount of existing screening vegetation near the dwelling. The EES indicated that additional screening could be provided near dwellings to reduce visual effects to a low level.

The Inquiry formed the view that the owners of dwellings within 1.5 km of the nearest wind turbine (see Figure 20.46 of the EES) should be offered the opportunity to have additional vegetation screening⁸ provided near their dwellings at the proponent's expense. The Inquiry recommended additional vegetation screening should also be offered to the owners of dwellings marked 4, 5, 104 and 105 on that figure (which are close to the 1.5 km distance) and to the Collins property at 800 Fingerboard Road, Yambuk (who have raised concerns about visual impacts).

The Inquiry has given further consideration to the visual amenity effects of aviation obstacle lighting at the wind farm. Because the Commonwealth Aviation Safety Authority (CASA) reversed its earlier opinion on whether this lighting was necessary for safety reasons, the Inquiry instructed the proponent to provide further public notice of the possible aviation lighting scheme that may be required at the Ryan Corner Wind Farm and its potential visual effects. One submission was received, which supported the use of aviation lighting for safety reasons.

The Inquiry has considered the potential effects based on a number of demonstration projects for different types, intensities and shielding of lighting. In addition the Inquiry chair visited the Mt Millar Wind Farm in South Australia which is lit according to CASA's requirements.

The Inquiry has found that the visual impact of aviation lighting can be mitigated to acceptable levels through landscaping and shielding of the lights.

It is my assessment that the effects on visual amenity from the proposed Ryan Corner Wind Farm would be acceptable, provided that:

- the owners of dwellings identified by the Inquiry above should be offered additional visual screening at the proponent's cost in view of the potentially significant effects on their views; and
- landscaping at non-stakeholder properties is undertaken and the lights are shielded to the maximum extent allowed under CASA's Advisory Circular "Obstacle Marking and Lighting of Wind Farms" AC139-18(0) July 2007.

Shadow flicker

The EES includes calculations of the shadow flicker that would be experienced by dwellings in the vicinity of the proposed Ryan Corner Wind Farm. Based on very

⁸ An example of a landscaping measure that could filter or reduce views of the wind farm from a dwelling is shown on Figure 20.65 of the EES.

conservative assumptions, it has been calculated that all but one dwelling would be subject to less than 30 hours per annum of shadow flicker. After making allowance for cloud cover, the actual shadow flicker at this dwelling would be lower than the level specified in the wind energy guidelines.

It is my assessment that the Ryan Corner Wind Farm would not result in unacceptable shadow flicker at dwellings.

Electromagnetic interference

Submitters have raised concerns about the deterioration of television reception following the commissioning of the Yambuk and Codrington wind farms and are concerned that there will be a similar problem with the Ryan Corner proposal.

The EES provides an outline of the television transmissions that could be affected by the Ryan Corner Wind Farm. Figure 12.2 of the EES identifies the zone of potential interference (generally within 5 km of the wind farm site). The EES describes a number of measures that could be used to ensure that television reception within this zone does not deteriorate. TME proposes to undertake monitoring of television reception at dwellings within the zone of potential interference before the commissioning of the proposed wind farm. According to the EES, the proponent would implement appropriate measures to rectify any loss in quality identified within six months after the facility is operational.

It is my assessment that any electromagnetic interference issues can be effectively managed provided the proponent:

- appoints a suitably qualified person to determine the strength of radio and television signals received at dwellings within the zone of potential interference identified in Figure 12.2 of the EES before construction of the wind farm;
- investigates any complaint about a loss of signal strength at a dwelling to determine if the loss of signal strength has been caused by the operation of the wind farm; and
- undertakes reasonable and feasible measures to restore the reception at least to the quality that existed prior to development of the wind farm.

Conclusion on amenity

It is my assessment that the Ryan Corner Wind Farm will not unduly affect the amenity of local residents, provided the mitigating measures described in the EES as modified by the Inquiry are satisfactorily implemented.

4.4 Flora and fauna

Flora

The Ryan Corner site is generally highly modified and has a long history of grazing, however some remnant native vegetation occurs in isolated patches and in the Riverside Road Reserve. The remnant native vegetation in the Riverside Road Reserve has a high quality.

The EES investigations of flora included surveys to map native vegetation on the site, as well as targeted surveys for specific threatened species.

The EES noted that it was difficult to discern the ecological vegetation classes (EVCs) for the remnant native vegetation because of the high degree of modification. The main EVCs are likely to be: Stony Knoll Shrubland, Plains Grassy Woodland and Aquatic Herbfield.

No flora species listed under the *Flora and Fauna Guarantee Act 1988* (FFG Act) were recorded on site during the EES field investigations; however the EES acknowledges the possible occurrence on the site of listed species such as Curly Sedge, Purple Clover and Leafy Greenhood.

The design of the wind farm has incorporated a number of measures to avoid or minimise impacts on native vegetation and threatened species. These include:

- selecting turbine positions and locating access tracks so they avoid native vegetation wherever possible;
- linking turbines in the west of the site to the substation east of the site by installing overhead cabling to span the Riverside Road reserve; and
- limiting vehicle access by providing only one vehicle crossing from the western to the eastern side of the wind farm; the crossing point has been selected to avoid the high quality remnant vegetation in the Riverside Road reserve.

These measures effectively avoid areas on the wind farm site containing the endangered Stony Knoll Shrubland EVC.

The Inquiry has found that the environmental impacts on flora should be negligible and can be avoided or managed in the context of the native vegetation management framework.

It is my assessment that the design of the wind farm incorporates sound measures to avoid or minimise the potential effects on native vegetation and significant flora species. Any residual effects on native flora can be satisfactorily managed through the preparation and implementation of a native vegetation management plan in consultation with DSE.

Terrestrial fauna

The EES investigations included a range of fauna surveys, including targeted surveys for threatened frog and reptile species that may occur on the site.

No herpetofauna (amphibians and reptiles) and no other ground fauna species listed under the FFG Act was recorded in the EES investigations. Nevertheless the EES acknowledges that there is a moderate likelihood of some of these species occurring on the Ryan Corner Wind Farm site (Swamp Skink, Growling Grass Frog). The proposed wind farm layout has been designed to avoid, as far as possible, habitat that would be suitable for such species.

The Inquiry is satisfied that the project, if implemented as outlined in the EES, will have negligible environmental impact on ground fauna, given the nature of the site as

cleared farmland and on the basis that the proposed turbine layout and access tracks have been selected to avoid disturbance to significant areas of habitat.

Having regard to the Inquiry's analysis, it is my assessment that the proposed Ryan Corner Wind Farm is unlikely to have a significant effect on ground fauna species that are listed under the FFG Act.

Avifauna

Comprehensive bird utilisation studies were undertaken at the wind farm site to provide the basis for an avifauna risk assessment. It was found that three introduced species (Skylark, Common Starling and European Goldfinch) made up about 53 per cent of the birds observed during the surveys. Waterbirds and raptors were present, but in very low numbers (3.7 per cent of birds observed).

Four bird species that are listed under the FFG Act were observed during the bird utilisation studies; these species were the Great Egret, Intermediate Egret, Little Egret and Brolga. Other species that are considered vulnerable were also recorded at the site (Glossy Ibis, Latham's Snipe and Hardhead). Apart from Latham's Snipe⁹, all observations of threatened bird species occurred in the south-east corner of the wind farm site, in the vicinity of Island Swamp, Duck Hole and ephemeral water bodies. The wind farm design includes a setback of turbines at least one kilometre from the water bodies in the south-east corner of the Ryan Corner site.

The EES examines the potential risks to threatened species based on their habitat, distribution and population numbers. The potential risk to waterbird species has been considerably reduced by the set back to the water bodies and avoidance of other key habitat areas.

The threatened species of most concern is the Brolga. The Victorian Brolga population is estimated to be about 600 however there appears to have been limited breeding success in recent years because of prolonged drought conditions. A Brolga pair was observed regularly near the water bodies in the south east of the site. Brett Lane and Associates conducted targeted Brolga surveys in the region (within 20 km) surrounding the Ryan Corner Wind Farm site in the breeding season (July to November 2006). A planned flocking season survey (December to May 2007) was not undertaken because the prolonged drought conditions meant that the significant wetland habitats on the site and in the wider region did not hold much water.

The potential effects of the Ryan Corner Wind Farm on the Brolga have been subject to detailed investigation in the studies supporting the EES and in material presented by the proponent and the Department of Sustainability and Environment (DSE) at the Inquiry hearings.

Having regard to the Inquiry's analysis and the expert evidence available, it is my assessment that the potential effects of the Ryan Corner Wind Farm on avifauna, including threatened species such as Brolga, are likely to be low.

⁹ The Latham's Snipe was recorded in the northern part of the site in a small patch of low quality grassland. This is a migratory species that is not listed under the FFG Act but is considered "near threatened" by DSE.

Southern Bent-wing Bat

The EES investigations included comprehensive surveys for the Southern Bent-wing Bat, which is a listed species under the FFG Act. As noted by the Inquiry, the bat surveys for the Ryan Corner Wind Farm represent one of the most extensive and highly detailed studies of the movement of this species conducted to date in Victoria. The usage of the wind farm site by bat species, including the Southern Bent-wing Bat, was found to be low because of generally poor habitat. The Blue Gum plantation adjoining the wind farm site was found to have much higher levels of bat activity¹⁰.

The Inquiry heard expert evidence on the potential effects on the Southern Bent-wing Bat from Dr Greg Richards (on behalf of the proponent) and Dr Lindy Lumsden of DSE.

Having regard to the Inquiry's analysis, it is my assessment that the potential risk to the Southern Bent-wing Bat from the Ryan Corner Wind Farm is low.

Conclusion on flora and fauna

It is my assessment that the Ryan Corner Wind Farm would not have a significant effect on flora and fauna provided the measures set out in the EES are satisfactorily implemented. A post-construction program for monitoring bird and bat mortality should be undertaken, in consultation with DSE. If unforeseen and significant impacts on threatened species are detected, the proponent should put in place appropriate mitigation or offsetting measures in consultation with DSE.

4.5 Cultural heritage

Objective: To avoid or minimise impacts on places with Aboriginal and non-Aboriginal cultural heritage values, to the greatest extent practicable.

Although there were no previous records of Aboriginal places in the Ryan Corner Wind Farm site, field investigations by the proponent's consultant, in consultation with the Framlingham Aboriginal Trust, identified two Aboriginal stone hut circles and a fish/eel trap. The wind farm design was modified to delete turbines near the stone hut circle and eel trap in the south-eastern part of the site. In addition, another turbine position was moved 100 metres to avoid impacts on the stone hut circle located in the middle of the wind farm site. The EES acknowledges that other Aboriginal cultural heritage sites may be discovered in subsurface investigations resulting in the need for further modifications to the wind farm layout.

The heritage investigations also identified a dry stone wall of low historical significance which will not be affected by the wind farm proposal.

Under the *Aboriginal Heritage Act 2006*, the proponent is required to submit a cultural heritage management plan for approval under the Act. It is my assessment that the potential effects of the Ryan Corner Wind Farm on cultural heritage can be

¹⁰ In the November 2006 survey, the average number of Southern Bent-wing Bat calls at survey points in the wind farm site was in the range 0.5 to 1.1 calls per night. At the survey point in the plantation, the average number was 8.9 calls per night. In the March 2007 surveys, a similar pattern of low wind farm usage by the species relative to the plantation and other areas preferred by this bat species was confirmed.

effectively managed through the approval and implementation of a cultural heritage management plan under the *Aboriginal Heritage Act 2006*.

4.6 Environmental management

Objective: To minimise any physical impacts from the construction and operation of the facility, such as erosion, sedimentation, road damage and traffic hazards.

Apart from the specific environmental effects covered in the preceding sections, the construction and operation of the Ryan Corner Wind Farm could have a number of other physical impacts requiring careful management. These include:

- potential erosion of exposed works areas;
- effects on waterways from site runoff;
- damage and disruption of traffic on public roads during the construction phase; and
- fire and other public safety risks.

The EES addresses a number of these potential effects and puts forward sound implementation measures to deal with these. In particular the EES outlines the measures that would be detailed in an environmental management plan including:

- a traffic management plan that details access routes to the sites, intersection upgrades and protocols for large vehicle movements;
- best practice measures for minimising soil erosion and managing site runoff;
- a waste management plan;
- operational measures to manage fire risks in liaison with the Country Fire Authority; and
- operational measures to minimise risks to public safety from blade failure, lightning strike and electrical equipment.

The Inquiry has found that the wind farm should not pose a risk to public safety and mitigation and management measures are available to reduce the risk even further.

Having regard to the Inquiry's analysis, it is my assessment that the preparation and implementation of an environmental management plan as outlined in the EES would satisfactorily manage the potential physical effects of the project.

4.7 Cumulative effects

Chapter 21 of the EES provides a comprehensive analysis of the full range of potential cumulative effects from the Ryan Corner Wind Farm. This analysis was guided by the Assessment Guidelines for the EES. The most significant issues, which extend beyond the immediate area of the wind farm, are the potential effects on the regional Brolga population and on landscape (because of the existing Yambuk and Codrington wind farms). The EES rated the cumulative effects as low.

The Inquiry has reviewed the cumulative effects put forward in the EES and found that the EES provides a reasonable response to the issue of cumulative impact. The Inquiry's view is that the cumulative effects are either of a low level of concern (e.g.

landscape) or can be effectively avoided or managed during project development (Brolga and Southern Bent-wing Bat).

Having regard to Inquiry's analysis, it is my Assessment that the cumulative effects of the Ryan Corner Wind Farm have been comprehensively assessed and they do not give rise to any unacceptable effects which would warrant refusal of the proposal.

4.8 Net societal benefit

Objective: Overall, to provide a clear societal benefit, taking account of economic benefits, social outcomes and residual environmental impacts.

The proposed Ryan Corner Wind Farm would have a capital cost in the order of \$250-300 million of which 25-30 per cent would be spent locally for civil works and tower construction. About \$1 million would be injected annually into the local economy during the operational life of the wind farm in the form of payments to farmers, rates, community support and salaries for operational staff.

The major employment benefits would occur in the construction phase with up to 120 jobs created. Ongoing employment of personnel to service both the Ryan Corner and proposed Hawkesdale wind farms would represent about 8 to 12 equivalent full-time positions.

The proposal is unlikely to have any significant negative economic effects on local business enterprises (predominantly agriculture).

The Inquiry found that the Ryan Corner Wind farm would have a net positive social and economic effect on the regional community.

The proposal would make an important contribution to the Victorian Government's efforts to maintain a secure, efficient and affordable supply of energy in Victoria while reducing the intensity of greenhouse gas emissions from the energy sector.

The potential adverse effects of the proposal on biodiversity, landscape, cultural heritage and residential amenity are unlikely to be significant provided the project is implemented in accordance with the mitigation measures specified in the EES and as further detailed in an environmental management plan.

Based on the foregoing, it is my assessment that the Ryan Corner Wind Farm would provide a clear societal benefit after taking into account economic benefits, social outcomes and residual environmental impacts.

5 RESPONSE TO INQUIRY RECOMMENDATIONS

The Inquiry's recommendations are reproduced in *italics* with the response by the Minister for Planning in normal type font below.

Recommendation in chief

Inquiry recommendation

The Inquiry recommends that subject to the detailed recommendations in this report, it considers that the environmental effects of the Ryan Corner Wind Energy Facility can be managed and a permit should be issued.

Minister's response

It is my assessment that the above recommendation be supported. It is my intention to grant a planning permit once the relevant cultural heritage management plan has been approved under the *Aboriginal Heritage Act 2006*.

Landscape and visual amenity

Inquiry recommendations

Landscaping for the infrastructure on-site should be provided in accordance with condition 4 of the draft planning permit in Appendix B.

Off-site landscaping should be offered to properties within 1.5km of the nearest turbine, to dwellings numbers 4, 5, 104 and 105 in Figure 20.46 of the EES and the Collins property at 800 Fingerboard Road Yambuk in accordance with condition 5 of the draft planning permit in Appendix B.

The visual impact of aviation lighting should be minimised by minimising the number of lit turbines and installing appropriate technical responses in accordance with condition 9 of the draft planning permit in Appendix B.

Minister's response

It is my assessment that the above recommendations be supported.

Aviation obstacle lighting

Inquiry recommendation

The Minister for Planning investigate aviation obstacle lighting for wind farms in conjunction with the wind energy industry and the Civil Aviation Safety Authority with a view to developing assessment criteria for obstacle lighting in the planning process.

Minister's response

I note the Inquiry's finding that the potential effects on visual amenity from aviation obstacle lights (if required) at the Ryan Corner Wind Farm could be mitigated to acceptable levels by landscaping at non-stakeholder properties and by shielding to the maximum extent allowed under the relevant CASA Advisory Circular and Manual of Standards. A number of wind farms have now been approved in Victoria which would require aviation obstacle lighting. At this stage none of these is currently fully operational. The Waubra Wind Farm is likely to be the first project with aviation obstacle lighting operational in Victoria. I have asked DPCD to discuss with

Sustainability Victoria the merits of conducting a post-construction survey to ascertain the community's response to the aviation obstacle lighting at the Waubra Wind Farm (once it is fully operational). This survey would provide a valuable indicator on the extent of any real effects of such lighting and the need for any further investigation of this matter.

Noise

Inquiry recommendation

Noise monitoring and any necessary compliance measures be undertaken in accordance with conditions 18-21 in the draft planning permit in Appendix B.

Minister's response

It is my assessment that the above recommendation be supported.

Flora and fauna

Inquiry recommendations

The detailed identification of areas to be cleared and the identification and implementation of necessary offsets should be undertaken in accordance with conditions 1-3 in the draft planning permit shown in Appendix C.

An Environmental Management Plan in accordance with condition 13 in Appendix B should be prepared and implemented to minimise any potentially detrimental effects on native vegetation during construction.

An Environmental Management Plan in accordance with condition 13 in Appendix B should be prepared and implemented to minimise any detrimental effects on ground fauna habitat during construction.

A post construction bird monitoring and response program should be prepared and implemented to minimise the environmental impacts on the Brolga population in accordance with condition 16 in Appendix B.

A post construction bat monitoring and response program should be prepared and implemented to minimise the environmental impacts on the Southern Bent-wing Bat population in accordance with condition 16 in Appendix B.

That any aviation lighting proposed for the site be designed to minimise impacts on bats and night flying birds in accordance with condition 9 in Appendix B.

Minister's response

It is my assessment that the above recommendations be supported.

Electromagnetic interference

Inquiry recommendation

Pre and post monitoring of electromagnetic interference be undertaken and mitigation measures implemented as appropriate in accordance with conditions 24-26 as shown in Appendix B.

Minister's response

It is my assessment that this recommendation be supported.

Traffic management

Inquiry recommendation

A Traffic Management Plan be prepared and implemented in accordance with conditions 10-11 in Appendix B.

Minister's response

It is my assessment that the above recommendation be supported.

Safety

Inquiry recommendation

A Wildfire and Emergency Response Plan be prepared and implemented as part of the Environmental Management Plan in accordance with condition 13 in the draft planning permit in Appendix B.

Minister's response

It is my assessment that the above recommendation be supported.

Aviation obstacle lighting

Inquiry recommendation

The Proponent seek to minimise to the greatest extent possible the aviation safety lighting required on the Ryan Corner Wind Farm in consultation with the Civil Aviation Safety Authority. A proposed permit condition (number 9) in Appendix B requires any such lighting to be to the satisfaction of the Minister for Planning.

Minister's response

It is my assessment that the above recommendation be supported.

Information to RAAF

Inquiry recommendation

Details of the height and location of turbines on the endorsed plans be supplied to the RAAF AIS in accordance with condition 28 in the draft planning permit in Appendix B.

Minister's response

It is my assessment that the above recommendation be supported.

Shadow flicker

Inquiry recommendation

Shadow flicker be monitored such that it does not exceed 30 hours per year at any non-stakeholder dwelling in accordance with conditions 22-23 in Appendix B.

Minister's response

It is my assessment that the above recommendation be supported.

Cumulative effects

Inquiry recommendation

The Minister for Planning considers developing a 'Cumulative Impact Assessment Framework' for wind farms in south western Victoria.

Minister's response

The Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978 provide guidance for the consideration of cumulative effects. While these Ministerial guidelines acknowledge the difficulty that can be faced by proponents in providing a regional perspective, they make it clear that the proponent is expected to provide an assessment of relevant effects (e.g. landscape values, risks to fauna) in a form that can be integrated with information relating to other projects and thus enable the Minister to assess the cumulative effects.

I note that the Inquiry was satisfied with the manner in which the cumulative effects of the Ryan Corner Wind Farm were considered in relation to other existing and approved wind farms in the region. I consider that the information provided in the EES is sufficient for me to assess the cumulative effects from a regional perspective and to endorse the Inquiry's finding that the cumulative effects are low and can be managed effectively.

JUSTIN MADDEN MP
Minister for Planning