

CHAPTER 1

Executive Summary

1. PREFACE

The Environmental Assessment (EA) has been prepared to provide a project description, discuss all potential effects of the Boco Rock Wind Farm on the existing environment and community, and discuss the measures proposed to manage and mitigate any potential adverse effects. The proposed development is for the purpose of generating electricity from wind energy.

The EA has been prepared in three volumes:

Volume 1: Main text (this volume)

Volume 2: Figures and Photomontages

Volume 3: Appendices

During the Public Exhibition phase of the assessment process the Boco Rock Wind Farm EA will be available for inspection at the Bombala and Cooma-Monaro Shire Council offices and online through the New South Wales Department of Planning website, following the links to the Major Project Assessments page.

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2. INTRODUCTION

The Proponent is proposing to install, operate and maintain up to 125 wind turbines and ancillary structures on an area of the high altitude plateau of the Monaro Plains, located within the Bombala and Cooma-Monaro Shire Council boundaries, approximately 6 kilometres (km) west of the township of Nimmitabel, New South Wales (NSW) (**Figure 2.1**); the proposed Boco Rock Wind Farm (the Project). The wind turbines will be erected for the purpose of generating electricity from wind energy.

The Project was publicly announced in September 2008, at the commencement of detailed feasibility studies and early stages of planning. The results of public consultations and feasibility assessments are presented in this EA, as part of the Development Application (DA) for the Project.

The EA may also be used in support of subsequent applications for approval under Section 78A of the *Environmental Planning and Assessment (EP&A) Act 1979 (NSW)* associated with the lease of land for the turbine sites and associated infrastructure.

The Project will also be assessed by the Federal Department of the Environment, Water, Heritage and the Arts (DEWHA) with respect to matters of National Environmental Significance under the *Environment Protection & Biodiversity Conservation (EPBC) Act 1999*.

This EA is broad in scope, covering many topic areas. This chapter, being the Executive Summary provides a summary of the outcomes established by the EA as a result of the assessments and consultation that took place.

The Proponent

The Project is being developed by Boco Rock Wind Farm Pty Ltd (the Proponent), a wholly owned subsidiary of Wind Prospect CWP Pty Ltd (WPCWP). WPCWP is a joint venture partnership between the Wind Prospect Group and Continental Wind Partners (CWP).

The Wind Prospect Group is a progressive global organisation that is responsible for the development, construction and operation of renewable energy projects in Australia, New Zealand, United Kingdom, Hong Kong, Canada, Ireland, France and the USA. Wind Prospect has over 18 years of experience in successful development in the industry and has been involved in over 2,500 megawatt (MW) of approved wind generation (both onshore and offshore) with 380 MW under construction or in operation throughout Australia.

Continental Wind Partners were established in 2007 to finance the development of wind farms in Romania and Poland. They have since grown to be a leader in renewable energy development, expanding into the rest of Europe, Australia and New Zealand; with projects totalling over 4,500 MW. Their primary focus remains in wind energy, however they also have interests in solar, hydro, biomass and other renewable energies.

Their successful and rapid expansion is based on a proven model of co-operation with local developers. Here CWP's international expertise in the finance/banking industry and technical aspects of development are combined with the developers own technical expertise and local

knowledge. It is this collaborative partnership that ensures accelerated, professional wind development in a mutually successful manner.

3. PROJECT DESCRIPTION

The proposed Project development consists of the installation of up to 125 wind turbines, an on-site electrical cable network, an on-site collector substation, access tracks, crane hardstand areas, up to four wind monitoring masts, and appropriate site signs. The Project is to have an installed capacity of approximately 270 MW, depending on the model of turbine selected. Operation of the wind farm is to be carried out by a combination of remote computer control, local operations and maintenance staff.

Final turbine selection will occur through a competitive tender process pending Development Approval. The turbines used for the Project will be three-bladed, semi-variable speed, pitch regulated machines with the rotor and nacelle mounted on a reducing cylindrical steel tower. Each turbine will rise up to 152 m from the ground to the tip of the blades, with typical tower heights of between 80 and 101.5 m, and blades between 44 and 52 m in length (noting that the 101.5 m tower would have a 50 m blade attached, whereas one of the wind turbine models under review possesses a 100 m tower with a 52 m blade length). The wind turbines under consideration for this Project vary in terms of generation capacity from between 1.8 and 3.3 MW. Typically turbines of this magnitude begin to generate energy at wind speeds in the order of 4 metres per second (m/s) (14.4 kilometres per hour (kph)) and shut down (for safety reasons) in wind speeds greater than 25 m/s (90 kph).

Approximately four permanent wind monitoring masts, up to 100 m in height, will be installed on-site. The purpose of the masts is to provide necessary information for the performance monitoring of the wind turbines. The wind monitoring masts would be of a guyed, narrow lattice or tubular steel design.

The electricity produced by each wind turbine generator would be transformed from 0.69 kilovolts (kV) up to 33 kV by a transformer generally located within or adjacent to each turbine. Underground electrical cables will be installed at a depth of approximately 0.8 to 1 m below the ground surface to conduct the electricity from the wind turbines to the collector substation. The underground electrical cables will follow site access tracks where practical.

The collector substation site is expected to require approximately 1 hectare (ha) of land and will include standard grid connection infrastructure and buildings. The chosen location minimises the visual impact of the wind farm by siting the collector substation away from frequently used public roads among the hills of the Sherwins Range. This position also allows for the Project's internal electrical infrastructure and grid connection to have a reduced visual impact.

To harness the energy produced by the Project, a new transmission line is required to connect it to the existing electricity grid. To meet this requirement the construction of a new double-circuit 132 kV overhead transmission line would be required to connect the Project with two existing Country Energy lines located approximately 25 km east of the collector substation. The proposed transmission line would become part of Country Energy's network, and as such Country Energy would be the ultimate owner and operator of the new transmission line infrastructure. Country

Energy is therefore considered to be the proponent for the proposed transmission line for the purposes of the *EP&A Act*.

Project management will be carried out by the Proponent, unless commercial or other arrangements change. All Project and construction management will comply with the appropriate company's Quality Assurance System and Environmental Management System, or equivalent, ensuring that relevant procedures, statutory requirements and operational standards are met.

Project management will also be in accordance with this EA and other documents, such as Environmental Management Plans (EMP's). An outline of the measures to be addressed in the full EMP has been developed for the Project and is contained in **Chapter 20** Statement of Commitments. It will be a requirement that all actions contained within the EMP are considered and incorporated into the Construction and Operational EMP's and other environmental documentation.

Proposed Transmission Line

An assessment of the proposed connection of the Project to the existing electricity network is subject to a separate Approval process; this is addressed in **Chapter 3** Project Description.

However information on the siting and likely impacts of the transmission line have been presented in this EA to demonstrate that the cumulative impacts of the development as a whole is acceptable and justified.

Sections relating to the proposed transmission line can be found at the end of each of the forthcoming chapters and are distinguished by means of grey shading (as with this section) to highlight for the reader the detachment between what is being sought Approval and that which is not.

4. PROJECT JUSTIFICATION

There has been growing global recognition of the need to mitigate the environmental effects associated with fossil fuel energy generation. Such thoughts have manifested into international, national and state wide commitments supporting the development of clean and sustainable energy projects.

In 2008, the Australian government ratified the Kyoto Protocol and signed up to cut greenhouse gas emissions to 108 % of the levels they were in 1990. This was a watershed decision and an important step in determining Australia's position on climate change in the international arena.

On 20 August 2009, the Federal Parliament passed through the Renewable Energy Target legislation, which aims for 20 % or 45,000 GWh of Australia's electricity to be generated from renewable sources by 2020. Wind energy generation is a low cost, viable renewable energy source and can be readily implemented to meet a substantial percentage of this target.

The Project will play an important role in contributing to both the increasing local and global need for such renewable projects in tackling the issues of Global Warming and Climate Change; contributing approximately 1.75 % of new renewable generation to meet the legislated Australian target. Moreover the Project site and size has been carefully selected using a number of factors and

will displace a conservative estimate of 13,984,793 tonnes of carbon dioxide equivalents over the life of the Project.

5. PLANNING CONTEXT

The development of the Project requires:

- Project approval under Part 3A of the New South Wales (NSW) *Environmental Planning and Assessment (EP&A) Act, 1979*; and
- Consideration of the requirements of the Commonwealth's *Environment Protection and Biodiversity Conservation (EPBC) Act, 1999*.

Department of Planning issued the Project with Director-General's Requirements (DGR's) on 1st June 2009. The DGR's include key and additional issues for the Proponent to address in the EA with a focus on impacts, management and mitigation strategies. The Project was then classified as a 'Controlled Action' under the *EPBC Act*, which saw the Project issued with supplementary DGR's on 18th September 2009. The supplementary DGR's apply to the accredited assessment process.

In addition, relevant Federal, State and Local Government legislation, policy and guidelines are considered and addressed throughout the EA.

6. STAKEHOLDER CONSULTATION

Consultation for the Project commenced in September 2008 during the early stages of planning and feasibility assessment. Consultations at this time aimed to inform the general public, neighbouring residents, statutory regulators and other stakeholders of the Project in order to identify issues that required addressing during project planning and design.

Consultation for the Project was conducted by way of letters of notification to stakeholders, face-to-face contact with neighbouring residents, a public exhibition and consultation meetings with various stakeholders. The Project website (www.bocorockwindfarm.com.au) presents an ongoing, active consultation medium for people to track the development of the Project and provide comment.

A number of consultees have responded, providing input or advice for the Project which has subsequently resulted in the modification of the Project design. The public exhibition, held at the Nimmitabel Country Club on 26th March 2009, was attended by over 100 local and regional residents. Results of the Public Opinion Surveys collected to date show that 69% of survey respondents supported the Project.

7. ASSESSMENT OF KEY ISSUES

The Proponent, along with a number of specialist consultants and stakeholders, have worked together using various methods during the feasibility and planning stages of the Project to determine the baseline environmental conditions at the Project site, identify potential impacts and develop management strategies to mitigate those impacts where possible. These assessments and consultations have been consolidated into this EA, to develop an optimal wind farm design that balances environmental, social, economic and cultural needs.

This EA is structured to address the requested key issues and non-requested additional issues by the DGR's under the *EP&A Act* that have the potential to create environmental or human impacts. These are summarised in the following sections of the Executive Summary with extensive detail found within the main chapters of this EA and associated **Volumes 2 and 3**.

8. LANDSCAPE AND VISUAL ASSESSMENT

The Proponent commissioned Green Bean Design Landscape Architects to prepare a Landscape and Visual Impact Assessment (LVIA) for the Project. The LVIA involved a comprehensive evaluation of the visual character of the landscape in which the Project would be located, and an assessment of the potential landscape and visual impacts that may result from the construction and operation of the Project, taking into account appropriate mitigation measures.

In terms of overall landscape sensitivity, the LVIA determined that each of the seven Landscape Character Area's within the Project viewshed had a Medium sensitivity to accommodate change, and represented a landscape that is reasonably typical of other landscape types found in surrounding areas of the Monaro, as well as landscapes within the wider regional context of the NSW Southern Tablelands.

The LVIA also determined that the Project is likely to be an acceptable development within the viewshed, which in a broader context also contains built elements such as roads, agricultural industry, aircraft landing strips, communication and transmitter towers and power lines.

There are a number of potential visual effects associated with the wind farm, including glinting, which experience suggests is relatively rare and shadow flicker effects which are not likely to be a significant issue for any of the local dwellings due to careful planning of the turbine layout. The Project will also have some degree of visual influence, however it is unlikely that wind farm projects will ever conform, or be acceptable to all points of view.

Surveys which targeted a number of local populations within the Southern Tablelands, suggested that around 89 % of respondents were in favour of wind farms being developed in the Southern Tablelands, with around 71 % of respondents accepting the development of a wind farm within one kilometre from their residential dwelling. This result is closely reflected in the responses gathered by the Project Proponent from a Public Opinion Survey and online survey which recorded 72 % of respondents approving of wind being used to generate renewable energy.

Overall, the cumulative visual effect of the Project in combination is considered to be low and it is considered that the Project is well-suited to the scale of the landscape and is unlikely to give rise to an unacceptable cumulative visual influence.

9. NOISE ASSESSMENT

Hearing is a fundamental human sense and is used constantly for communication and awareness of the environment. Noise is generally described as being 'unwanted' or 'unfavourable' sound and, to some extent, is an individual or subjective response as what may be a sound to one person, may be regarded as noise by another.

The unique acoustic emissions from wind turbines can be a potential problem for closely located residents. Noise assessments have been carried out by Heggies Pty Ltd, to predict the likely noise levels for comparison with the South Australian Environmental Protection Authority (SA EPA) *Noise Guidelines for Wind Farms* (February 2003) (SA EPA Guidelines). This document was developed to assess and manage environmental noise impacts from wind farms in South Australia and has been adopted by the NSW Department of Planning (DoP). The SA EPA have since prepared revised noise guidelines (*Wind Farms Environmental Noise Guidelines (Interim)*, 2007), however these are yet to be implemented in NSW and are not considered here.

Wind turbine noise has been predicted and assessed against relevant criteria prescribed by the SA EPA Guideline and World Health Organisation (WHO) goals where appropriate. Layout Option 1 (125 WTG's), equipped with REpower MM92, 92.5 m rotor diameter, 100 m hub height, 2.05 MW turbines was predicted to comply to all relevant noise criteria, SA EPA Guideline and WHO limits, at all respective receivers. Layout Option 2 (107 WTG's), equipped with Siemens SWT-2.3-101, 101 m rotor diameter, 100 m hub height, 2.3 MW turbines was also predicted to comply with all relevant noise criteria, SA EPA Guideline and WHO limits, at all respective receivers.

Construction noise impact, blasting impact and vibrations levels have been assessed and the 'worst case' scenarios modelled and were found to be generally acceptable. Construction traffic noise impact has also been assessed and the 'worst case' maximum construction traffic generated scenario would increase existing traffic noise levels along local roads by up to 3 to 7 dBA, but due to the typically large setback of dwellings from the road network, this would result in noise level that would be considered acceptable.

10. FLORA AND FAUNA ASSESSMENT

Eco Logical Australia Pty Ltd (ELA) was commissioned in October 2008 to undertake an ecological assessment of the area proposed to be affected by the Project. The assessment methodology comprised a literature review, site reconnaissance, vegetation mapping and detailed flora and fauna surveys.

Targeted surveys for threatened species were undertaken across the study area between October 2008 and May 2009. Vegetation mapping, flora quadrats and an assessment using the Biobanking methodology were also undertaken.

The study area was found to support seven threatened fauna species and one endangered ecological community. Habitat was also present for a variety of threatened flora species although none were recorded. Threatened species and endangered ecological communities recorded on-site included:

- Natural Temperate Grassland (*EPBC Act*)
- Grassland Earless Dragon (*Tympanocryptis pinguicolla*) (*TSC Act & EPBC Act*)
- Little Whip Snake (*Suta flagellum*) (*TSC Act*)
- Diamond Firetail (*Stagonopleura guttata*) (*TSC Act*)
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) (*TSC Act*)
- Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*) (*TSC Act*)
- Squirrel Glider (*Petaurus norfolcensis*) (*TSC Act*)

One migratory species, the White-bellied Sea-Eagle (*Haliaeetus leucogaster*) (EPBC Act), was also recorded within the Project site, along the MacLaughlin River.

A Referral under the EPBC Act was submitted to DEWHA in May 2009 for the likely impacts of the Project on the Grassland Earless Dragon (GED) and Natural Temperate Grassland (NTG). Negotiations were held between the Proponent and DEWHA in an attempt to minimise impacts on NTG and threatened species. A decision to deem the Project a Controlled Action under the EPBC Act was made on 18th August 2009 and subsequently, DEWHA provided the Proponent with supplementary DGR's on the 18th September 2009, which have been addressed within this EA.

The Proponent has made a number of amendments to the proposed layout to minimise and avoid impacts on the ecological values of the site. Given the extensive areas of NTG across the site area, particularly across the Sherwins Range, and the requirement for turbines to be placed on ridge tops, the opportunities to avoid all impacts on NTG are limited. However, whilst it is not possible to completely avoid placing turbines in any areas supporting woodland as this would impact upon the Project feasibility, a number of amendments have been made to minimise impacts in these areas. The linear layout of turbines along ridgelines, required for the wind farm to function at maximum capacity and be economically feasible, in some cases limits the areas to which turbines can be moved to avoid impacts.

The avoidance measures that will or have been implemented to minimise impacts on the ecological integrity of the site whilst maintaining the engineering and economic feasibility of the wind farm are summarised below:

- Access roads have been designed to follow current tracks and roads present within the study area where possible to minimise additional vegetation clearance for access;
- Electrical cables will be placed underground and within the road footprint where possible to allow for temporary rather than permanent disturbance; and
- Electrical cables will pass overhead across significant gullies and waterways to reduce impacts.

NTG is present across much of the western portion of the site. Whilst it is not possible to avoid areas of NTG completely, the following has been undertaken to minimise and avoid impacts on this community:

- Road layouts have been placed outside areas of NTG so as to minimise fragmentation of NTG where feasible;
- Potential locations for concrete batching plants have been sited in disturbed and sown areas to avoid further impacts on NTG; and
- Temporary construction facilities will be located in disturbed areas and within the current development envelope wherever possible.

Specific avoidance measures have been formulated for the GED and other recorded threatened species in consultation with DECC, DEWHA and independent specialists with respect to the GED species and their habitat; these are addressed in detail within the body of **Chapter 10** Flora and Fauna.

Impacts on woodland areas have been avoided where possible and the open nature of the landscape means that through careful planning much of the potential tree removal can be avoided. Avoidance measures within woodland areas include:

- Placement of turbines such that tree clearing is avoided where possible;
- Hollow-bearing trees have been avoided where possible and will be further avoided during the detailed design phase through the provision of a buffer of 30 m between all turbines and hollow-bearing trees where practical (as agreed with DECC); and
- Where possible, turbines have been placed in woodland areas where ground layer disturbance has previously taken place (e.g. sown areas).

Three alternative offset packages have been proposed to compensate for the impacts of the Project that cannot be ameliorated through avoidance and mitigation measures. There is also the potential for these to be modified in negotiation with the relevant authorities and a combination of options to be provided, if required. Each of the proposed offset options has been discussed with DECC and DEWHA.

- Option 1: Biobank (or equivalent) agreements with adjacent landowners to the Project comprising a range of vegetation and habitat communities;
- Option 2: Biobank (or equivalent) agreements with adjacent landowners to protect up to 500 ha of NTG; and
- Option 3: Three year monitoring program including survey of GED distribution and habitat and relocation studies.

DECC has advised that their preference would be Option 2 due to the recent decline of GED which would afford greater priority to the protection of a larger area of known habitat for this species than the proposed areas of Snow Gum Woodland and Ribbon Gum Open Forest.

It is noted that all of the vegetation communities being impacted are 'Red Flagged' due to either being listed as endangered ecological communities or vegetation types in moderate-good condition that are greater than 70 % cleared in the Southern Rivers Catchment Management Authority (CMA) region. The GED is not red flagged. Therefore consistent with the principles for varying red flags, it is proposed that additional credits could be purchased and retired including surplus credits generated for the GED and Striped Legless Lizard.

11. CULTURAL HERITAGE ASSESSMENT

New South Wales Archaeology Pty Ltd was commissioned in December 2008 to undertake an archaeological and cultural heritage assessment comprising of a literature review and field surveys to collect data.

It is believed that Aboriginal people lived in the Cooma-Monaro district and its environs for at least 21,000 years and that there was seasonal usage of the high country, with migration occurring predominantly in summer to attend inter-tribal ceremonies, which were not known to have taken place within the Project site. The early 1800's saw changes in the traditional land use of Aboriginal people with the introduction of European settlement.

European settlement of the area began in the late 1820's, with settlement of Nimmitybelle (Nimmitabel) established in the early 1830's. The town was officially surveyed in 1858 and with the development of local mining and increased settlement from the *Robertson Land Act 1861*, the town enjoyed substantial growth.

In accordance with the *Interim Guidelines for Aboriginal Community Consultation (IGACC) – Requirements for Applicants* (NSW Department of Environment and Conservation (DEC) 2004), the required field surveys were conducted with the assistance of two Aboriginal groups that responded to an invitation to tender; namely the Eden Local Aboriginal Land Council and Yukembruk Merung Ngarigo Consultancy Pty Ltd (Representing the Bega Local Aboriginal Land Council).

The assessment report determined that the archaeological resource in the Project site does not surpass significance thresholds under the *Aboriginal cultural heritage standards and guidelines kit* (National Parks and Wildlife Service (NPWS) 1997), which would preclude impacts. However, the construction of the Project will result in substantial physical impacts to any Aboriginal objects which may be located within direct impact areas irrespective of their archaeological significance. That is, any Aboriginal object situated within an area of direct impact will be comprehensively disturbed, and/or destroyed during construction.

Fences and one recorded sheepfold were the only heritage items to occur within the Project site; however impact will be minimal and partial in nature. Other heritage items occurring close, but outside of the Project site, include a camp site, house ruin and one recorded sheepfold.

Ground disturbance will occur predominantly during the construction phase of the Project with the potential to cause direct impacts to any Aboriginal objects or Non-Indigenous items which may be present on-site. Aboriginal objects (stone artefacts) can be expected to extend in a relatively continuous, albeit low density distribution across the broader landscape encompassed by the Project. Overall the proposed impacts are predicted to be discrete in nature due to the relatively small footprint of construction activities and, therefore, impacts to the archaeological resource across the landscape can be considered only partial in nature.

12. TRAFFIC AND TRANSPORT ASSESSMENT

Bega Duo Designs was commissioned to undertake a Traffic and Transport Assessment for the proposed Project. The study was conducted in accordance with the NSW Roads and Traffic Authority (RTA) *Guide to Traffic Generating Developments* and the DGR's, and provided a technical appraisal of the traffic and safety implications arising from the Project.

The assessment concluded that as a result of the Project an additional 240 vehicles per day would be expected during the construction period. This could have a significant impact on the existing road users, especially on the minor and unsealed roads, for approximately two years until construction of the Project has finished. Major impacts are expected to occur during the construction period, with minor impacts during the operational phase.

A range on management and mitigation strategies have been proposed during the construction, operation and decommissioning phases of the Project to minimise traffic impacts, reduce

community disruption and the risk of traffic incidents. In turn this will facilitate minimum disruption to existing traffic conditions.

13. AVIATION ASSESSMENT

Existing aviation activity in the locality of the Project site was identified during planning and design through consultation with the Department of Defence (DoD), Civil Aviation Safety Authority (CASA), Airservices Australia (AA), Aerial Agricultural Association of Australia (AAAA) and the local community.

There are no aerodromes within or in the vicinity of the Project Study area, so there are no concerns with regards to the Project impacting on OLS and PANS OPS of airfields. CASA administers regulations for the intrusion of obstacles into aerodrome OLS and PANS OPS and obstacles 110 m above ground level outside of aerodromes. Part of these regulations include lighting requirements for tall structures. As the proposed turbine height for the Project is up to 152 m, this requires CASA to assess the Project. However, at the time of writing this EA, CASA withdrew the Advisory Circular regarding turbine lighting for wind farms and currently wind farm developers are guided by the CASA Manual of Standards Section.

The Proponent engaged the Ambidji Group to conduct an independent Aeronautical Impact Assessment and Obstacle Lighting Review, which determined that the Project does not have any operational justification for the provision of obstacle lighting, and therefore will not require any turbines to have hazard lighting. The Proponent will negotiate with CASA to strike a balanced solution (pending Development Approval), which takes into account the impact on local residents as well as the safety of aviators. Shielding will be incorporated to mitigate the visual impact if lighting is required on any turbines.

Agricultural aerial spraying activity occurs for pest management and pasture top-dressing. Pest management spraying is unlikely to be affected by the Project. Top-dressing activity will require care by pilots applying the material to properties along the ridgelines.

Some private landing strips are present, located and orientated away from turbine areas. As such the proposed turbines are unlikely to present a hazard to the use of these strips.

14. COMMUNICATION ASSESSMENT

Electromagnetic signals (or radio waves) are transmitted throughout the country as part of telecommunication systems by a wide range of operators. Such systems are used for radar, radio broadcast, television, mobile phones and mobile and fixed radio transmitters. Electromagnetic signals generally work best if a clear path exists between the transmitting and receiving locations, known as line of sight (LOS).

There is the potential for interference from any large structure, including wind turbines, which occur within or close to the signal path. Signals can be interfered with or reflected by the rotating blades of a wind turbine, which could degrade the performance of the signal (Bacon 2002). Electromagnetic emissions from generators and other machinery also have the potential to affect signals; however with modern turbine generators and strict International Electrotechnical Commission (IEC)

regulations for manufacturers, there are now negligible emissions from wind turbines (Auswind 2006).

There are a few point-to-point links and omnidirectional services which occur across and next to the Project. Due to the layout of the Project, the predicted impacts are expected to be minimal. There remains a chance that television interference may occur for some landowners in the area, however if any effects are noted, then the Proponent will conduct an investigation with the afflicted party and provide a suitable solution.

15. ELECTROMAGNETIC FIELD ASSESSMENT

Electric and magnetic fields (EMF's) are associated with a wide range of sources and occur both naturally as well as man-made. Naturally occurring EMF's are those associated with lightning or the Earth's magnetic field. Man-made EMF's occur wherever electricity is present, meaning we are constantly exposed to EMF's in our home and work environments.

Wind farms create EMF's from operational electrical equipment, such as transmission lines, substations and the electrical components found within the wind turbines. This equipment has the potential to produce Extremely Low Frequency (ELF) EMF's, which means the current will alternate direction between 30 and 300 times per second, or at 30 to 300 Hertz (Hz).

The measurements of electromagnetic fields can vary within a wind farm, depending on the placement of equipment such as turbines, substations and internal electrical cables. The *Interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields* (NHMRC 1989) places guidelines on exposure to both electric and magnetic fields for the public and construction industry.

The typical strategy for reducing electromagnetic fields is distance from the source. Other strategies also include burying cables and placing cables together to cancel the emitted fields. As most of the wind turbine electrical equipment is encased within the turbine, in housing at the base of the tower or located 80 to 100 m above ground level, the distance and shielding from electromagnetic fields decreases the impact from emitting sources.

Electromagnetic fields can be recorded highest at substations; however, appropriate fencing and remote placement of the substation within the landscape can greatly reduce any exposure to electromagnetic fields.

16. FIRE AND BUSHFIRE ASSESSMENT

Fire and bushfire impacts of the Project on human life and property have been assessed in accordance with the DGR's and the *Rural Fires Act 1997*.

By basing the risk management process on the AS/NZS 4360-2004 *Risk Management* (Standards Australia 2004) and the National Inquiry on Bushfire Mitigation and Management (Council of Australian Governments (COAG) 2004), an analysis and evaluation of bushfire risk and acceptable risk treatments have been undertaken.

The Project occurs in an area of low bushfire risk due to the vegetation and agricultural practices in the area. By reviewing the possible ignition sources from the wind farm and analysing bushfire risk

assessments on life and property, it is possible to create mitigation and management strategies to minimise the Projects impact on fire and bushfire risk. Through implementing these strategies in a Bushfire Emergency and Evacuation Plan it is possible to increase the awareness of the procedures of bushfire emergencies, increase the preparedness of construction and maintenance staff, and facilitate orderly and safe evacuation and refuge during times of bushfire. The consideration of these mitigation and management strategies will allow the Project to decrease its impact on fire and bushfire hazards.

17. WATER ASSESSMENT

The Project site is not under a Gazetted Water Sharing Plan (WSP) as prepared under the *Water Management (WM) Act 2000*. The Project does however fall under the Southern Rivers Catchment Management Authority (CMA), and there are a number of water management targets in place including water sharing, water quality, management of water supply and wastewater, water conservation and efficiency, and river and wetland protection and rehabilitation. Water required for the Project, as discussed in **Chapter 3** Project Description, will be sourced from an existing 91 mega litre man-made dam rather than any natural surface flows, such as rivers and streams.

Moreover, since the Project will be sourcing its water from an existing on-site dam, there will be minimal impacts to surrounding groundwater and surface waters due to limited activities within these areas and effective mitigation actions and management. Potential impacts are likely to occur mostly from construction activities. However with a Soil and Water Management Plan in place, all potential impacts can be managed resulting in minimising the risk of remediation efforts being required on-site.

18. GENERAL ENVIRONMENTAL ASSESSMENT

The General Environmental Assessment chapter addresses aspects of the proposed project beyond the key issues identified in the DGR's. In summary the following aspects are assessed in terms of the existing situation, potential impacts and, where necessary, the management and mitigation measures put in place:

- Climate;
- Air quality;
- Soils and landforms;
- Waste;
- Responses to consultation; and
- Aspects relating to construction.

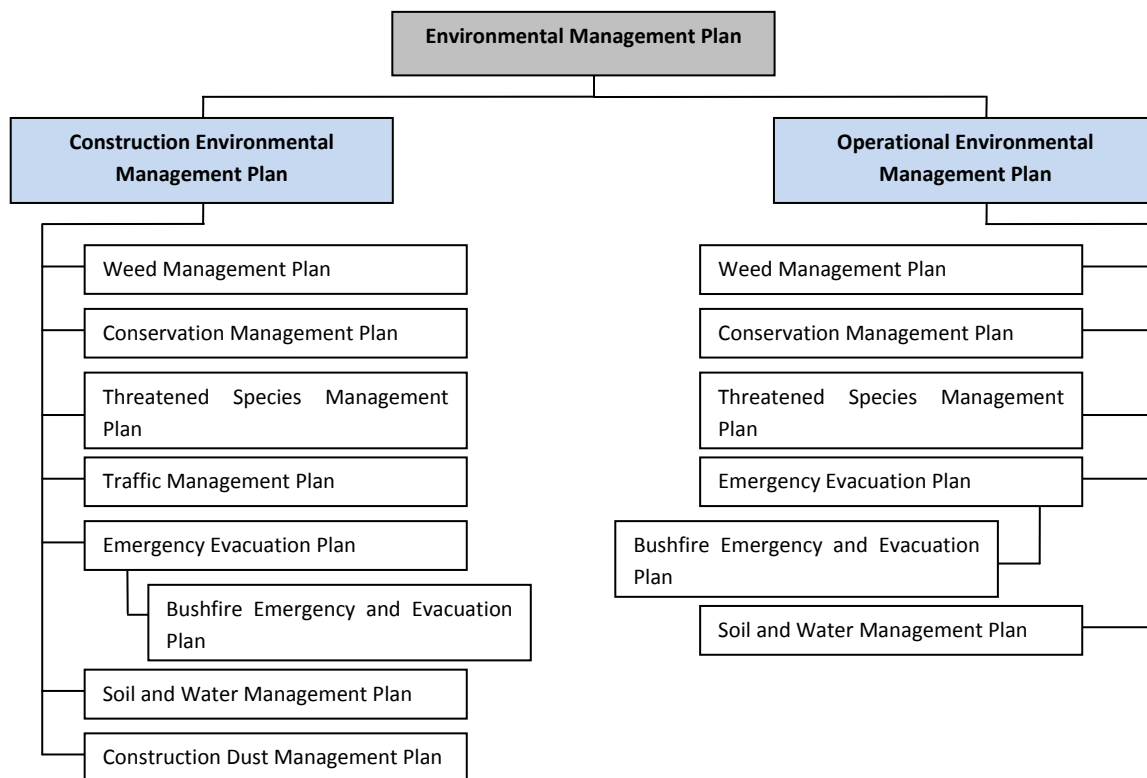
19. SOCIO-ECONOMIC ASSESSMENT

The Socio-Economic Assessment chapter addresses aspects of the proposed project beyond the key issues identified in the DGR's. In summary the following aspects are assessed in terms of the existing situation, potential impacts and, where necessary, the management and mitigation measures put in place:

- Land value;
- Mineral exploration;
- Tourism;
- Community wellbeing and Community fund; and
- The local economy.

20. STATEMENT OF COMMITMENTS

The Statement of Commitments (SoC) is a review of all management and mitigation measures mentioned in previous chapters of this EA that will be managed by the Proponent. The framework for the SoC is displayed below, and comprises an Environmental Management Plan (EMP) that combines the Construction Environmental Management Plan (CEMP) and the Operational Environmental Management Plan (OEMP). Within both of these plans there are a number of sub-plans to assist in the amelioration, management and mitigation of environmental impacts from the construction and operational phases of the Project.



21. CONCLUSION

This EA has assessed the potential environmental impacts that may result from the proposed Project, a proposal incorporating up to 125 wind turbines and capable of generating in the order of 270 MW of new renewable energy generation.

The proposal has been assessed in accordance with the *Environmental Planning and Assessment Act 1979* and taken into consideration the *Environment Protection and Biodiversity Conservation Act 1999*, along with other Federal, State and Local Government legislation, policy and guidelines.

The Project has incorporated the findings identified through the design phase, including consultation with the local community and associated stakeholders. The potential impacts of the Project have been assessed and appropriate avoidance, mitigation and management measures proposed. **Chapter 20** Statement of Commitments details all measures to which the proponent has committed to implementing during the pre-construction, construction, operation/maintenance and decommissioning phases.

Benefits of the proposal have been identified at a global, regional and local scale, including:

- Production of approximately 785,663 MWh per annum, sufficient for the average consumption of 113,436 homes (based on conservative calculations). A figure equal to 1.75 % of the 45,000 GWh Renewable Energy Target;
- Displacement of greenhouse gas emissions by approximately 699,240 tonnes of CO₂-e per annum, the equivalent of taking 161,487 cars off the roads (based on conservative calculations);
- Provision of local jobs, a Community Fund to benefit the local area in the vicinity of the Project and the injection of approximately \$700 million into the Australian economy; and
- Improved security of electricity supply through diversification.

The Proponent is committed to ensuring the measures proposed in developing the Project are best practice, and that they maintain the high standard set in all regions within which the Wind Prospect Group operate.