



Stockyard Hill Wind Farm Application for Planning Permit

Volume I
Planning Permit Application Report

for Stockyard Hill Wind Farm Pty Ltd

October 2009

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Planning Permit Application Report

For:

Stockyard Hill Wind Farm Pty Ltd

October 2009

Reference: 0106120 - FINAL REV2

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Stockyard Hill Wind Farm

Planning Permit Application Report

*For:
Stockyard Hill Wind Farm Pty Ltd*

October 2009

Reference: 0106120 - Final

For and on behalf of
Environmental Resources Management
Australia

Approved by: Allan Wyatt

A handwritten signature in black ink, appearing to read 'Allan Wyatt', with a long vertical line extending downwards from the end of the signature.

Signed:

Position: Partner

Date: 15 October 2009

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EXECUTIVE SUMMARY

THE PROJECT

Stockyard Hill Wind Farm Pty Ltd (SHWF) is a subsidiary of Wind Power Pty Ltd, both of which are wholly owned subsidiaries of Origin Energy Wind Holdings Pty Ltd, which is in turn a member of the publicly listed Origin Energy group of companies. SHWF proposes to develop the Stockyard Hill Wind Farm in south-west Victoria, which comprises installation of 242 wind turbines. The proposed wind farm will be capable of generating approximately 1,891 GWh per year of electricity (based on a long term average forecast) thereby making a significant contribution to renewable energy targets as well as a reduction in emissions of greenhouse gases.

The wind farm site is located within the Pyrenees Shire and covers an area of approximately 15,617 hectares.

Key facts of the Stockyard Hill Wind Farm

Site Area (ha)	15,617
Number of Landholders	55
Number of turbines	242 turbines
Turbine MW Class	2-3 MW
Power Generation (MWh) pa based on a long term average forecast	1,890,969 based on 2 MW turbines)
Capacity Factor	44.6%
Turbine Height	Up to 132 m
Hub Height	Up to 80 m
Rotor Diameter	Up to 104 m

In addition to the turbines, the project will include the construction of an underground electrical cable network and above ground 132kV powerlines, five substations, a maintenance facility, three temporary staging areas, a network of internal access tracks, three temporary concrete batching plants (for construction purposes), business identification signs, car parking and bicycle facilities, anemometers (monitoring masts) and the removal of native vegetation.

The wind farm site is generally bounded by Stockyard Hill Road, Long Gully Road, Dalgleish Road and Caramuir Road to the north and east, Eurambeen-Streatham Road and Beaufort-Carranballac Road to the west and the Glenelg Highway to the south. Skipton and Stockyard Hill Roads bisect the site.

The site is used predominantly as freehold agricultural land. SHWF has entered into commercial agreements with 55 landholders to host the wind farm.

APPROVAL PROCESS

SHWF submitted an EES Referral on 30th June 2008 to the Victorian Minister for Planning, to confirm whether an Environmental Effect Statement (EES) was required for the project pursuant to the Environmental Effect Act 1978 . The Minister decided on 29th September 2008 that the project did not require an EES, subject to the three conditions identified below:

- A report is to be submitted to the Minister for Planning on the potential effects of the Stockyard Hill Wind Farm on the Victorian Brolga population and offsetting measures needed to address adverse effects. The report is to use a population viability analysis approach or other suitable methodology endorsed by the Department of Sustainability and Environment (DSE) and is to be prepared to the satisfaction of the Secretary of DSE or delegate.*

- A report is to be submitted to the Minister for Planning on the potential effects of the Stockyard Hill Wind Farm on the cultural heritage significance of Mawallok. This report is to take into account the statement of cultural heritage significance prepared by Heritage Victoria and identified by Victorian Heritage Number PROV H0563 and must be prepared to the satisfaction of Heritage Victoria.
- A report identifying corridor options for an extension of the national electricity grid to the Stockyard Hill Wind Farm site, and assessing sensitivities with respect to landscape and fauna values, including potential impacts on Brolga, is to be prepared to the satisfaction of the Secretary of the Department of Planning and Community Development, or delegate, and submitted to the Minister for Planning.

The required assessments were prepared and submitted to the Minister for review. On the 16th September 2009 the Minister determined that the three conditions, listed above, had been 'satisfactorily met' (refer to Annex D- Minister's EES Decision).

A Referral pursuant to the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) was registered by the Department of the Environment, Water, Heritage and the Arts (DEWHA) on the 28th January 2009. On the 15th July 2009 DEWHA determined that the proposed Stockyard Hill Wind Farm is a 'controlled action' pursuant to this act. The proposed wind farm will be assessed, for the purposes of the EPBC Act, under the processes accredited by the new bilateral agreement, under Section 45 of the Act. The Commonwealth and the State of Victoria recently entered into a bilateral agreement under s45 of the EPBC Act, under which a number of State processes, including Advisory Committees under the PE Act, are accredited as assessment processes under the EPBC Act. The proposed wind farm will be assessed, for the purposes of the EPBC Act, by way of an Advisory Committee convened under the PE Act which will report to the Commonwealth Minister for Environment.

In addition, the Minister for Planning determined that the proposed Stockyard Hill Wind Farm should be assessed under the Planning and Environment Act 1987 (PE Act) and the associated Wind Energy Guidelines. Therefore, a planning permit is sought to develop and use the Stockyard Hill Wind Farm. A permit is also sought for the removal of native vegetation, alterations to two roads located in a Road Zone Category 1 (RZ1) and for business identification signs.

Following consultation with the Department of Planning and Community Development (DPCD) a separate planning application has been prepared for the removal of native vegetation to facilitate the development of a 132kV powerline route and the development of a terminal station that will form part of the Stockyard Hill Wind Farm's connection to the National Electricity Grid.

Further details of the approval process are within Section 7 of this report.

CONSULTATION

SHWF recognises the importance of community consultation at each stage of the planning and development process of the Stockyard Hill Wind Farm.

SHWF believes the main aim of undertaking consultation is to achieve community support and consent for the development. Their approach also recognises that community consultation should inform the community about the project, identify key issues and opportunities and provide a mechanism for feedback.

SHWF has undertaken many consultation activities with key stakeholders including several public meetings, informal BBQ / meetings to discuss the Brolga study, numerous visits to neighbouring residencies, regular presentations to the Pyrenees Shire Council and ongoing liaison with DSE and DPCD.

For further detail of the consultation approach and results of activities please refer to Section 2 of this report.

SITE ANALYSIS

The site proposed for the Stockyard Hill Wind Farm is located approximately 150 km west, north-west of Melbourne and approximately 35 km west of Ballarat.

The primary use of the site is agriculture with the majority cultivated for grazing and cropping. The site has a long history of agricultural use and accordingly is highly modified with little remnant vegetation remaining on the site. The landscape is punctuated by Monmot Hill, a volcanic cone and Mount Emu which is a granite hill.

The local geology of the site and the surrounding area is quaternary basalt derived from ancient eruption points, such as Stockyard Hill, which is an extinct volcano and its crater currently holds Black Lake which is an ephemeral semi-saline water body (currently dry).

There are several State parks within proximity to the site; namely Langi Ghiran State Park located approximately 20 km and Mount Buangor State Park located approximately 8 km, north-west of the nearest site boundary.

The site has not previously been surveyed for any cultural heritage purposes and very few heritage surveys have been completed in the region. There are however two previously recorded Aboriginal sites and four non Aboriginal historic structures previously recorded within the activity area.

Infrastructure on site is predominantly agricultural in nature and includes sheds, dams, access tracks and fencing. The site also contains water mains, electricity cables and telephone cables. Septic tanks are located at each dwelling. The surrounding area contains the agricultural infrastructure similar to that of the site. In addition to the agricultural infrastructure, three anemometers (monitoring masts) are currently located on the site.

Existing wind farms closest to the site's boundary are located at Challicum Hills, approximately 25 km north-west and Waubra Wind Farm, located approximately 32 km north-east. The approved Lexton Wind Farm is located approximately 29 km to the north of the site. It should be noted that the above measurements have been calculated from the outer edge of the proposed Stockyard Hill Wind Farm site to the centre of these wind farms. The identified distances were not calculated using GPS coordinates and are hence only an approximation of distance. In addition, should the distances be measured from the nearest Stockyard Hill Wind Farm turbine to the nearest neighbouring wind farm turbine, the distances would be less.

The Victorian Wind Atlas 2003 identifies that the Stockyard Hill Wind Farm is located within an area that receives an average wind speed of between 7 and 7.5 m/s at a height of 65 metres.

For further details of the Site Analysis for the proposed Stockyard Hill Wind Farm please refer to Section 3 of this report.

PROJECT DESCRIPTION

It is proposed to develop and use the site as a wind energy facility. A permit is also sought for the removal of native vegetation, alterations to two roads located in a Road Zone Category 1 (RZ1) and for business identification signs.

The main components of the project are as follows:

- 242 wind turbines with a maximum height of 132 m;*
- Underground electrical cable network, linking each turbine to one of five substations;*
- Above ground powerlines linking the five substations;*
- Three temporary staging areas;*
- Maintenance facility;*
- A network of internal access tracks;*
- Three temporary concrete batching plants (for construction purposes);*
- Business identification signs;*
- Car parking and bicycle facilities; and*
- Anemometers (monitoring masts)*

It is noted that no obstacle lighting is currently proposed.

Non-vegetated areas cover the majority of the development footprint. A limited area of native vegetation (5.28 hectares) will therefore be removed. A total vegetation value offset of 3.09 habitat hectares is required for vegetation proposed to be removed by the project. The proponent has identified adequate offset areas within the site to be set aside in order to compensate for the loss of native vegetation.

For further details of the Project please refer to Section 4 of this report.

DESIGN RESPONSE

The design and layout of the proposed Stockyard Hill Wind Farm responds to the existing features and conditions of the site including locating turbines to minimise and avoid the need for vegetation removal, ensuring compliance with noise standards, avoiding areas of cultural heritage significance and minimising the impact of the ongoing agricultural practices. In addition, turbine numbers were reduced by more than 100 from the original concept to protect the Brolga population.

SHWF undertook an initial feasibility assessment for this project in 2006, and has in addition, undertaken feasibility assessment for other sites throughout Victoria and interstate. The results of these assessments indicate that the proposed site for the Stockyard Hill Wind Farm is considered commercially suitable for development of a wind farm at the present time.

Whilst SHWF has undertaken micro-siting to avoid any adverse environmental impacts, a flexibility of up to 100 m in any direction is required in setting the final wind turbine locations to allow for issues such as geotechnical, noise, cultural heritage, wind data, fauna and flora, construction considerations and siting of permanent anemometers (monitoring masts).

For further details of the Design Response for the Stockyard Hill Wind Farm, please refer to Section 5 of this report.

ENERGY OUTPUTS

Energy estimates undertaken by wind engineers Garrad Hassan indicate that the Stockyard Hill Wind Farm should generate approximately 1,891 GWh of electricity per year (based on a long term average forecast) which is derived from an estimated capacity factor of 44.6%, and equates to providing the equivalent of more than 270,138 dwellings with electricity, reflecting approximately 21% of Melbourne's homes.

For further details on energy outputs please refer to Section 6 of this report.

LAND CAPABILITY

The proposed wind farm is located to the south of the Main Divide in western Victoria. The Main Divide features two major land form regions, the southern flanks of the Western Uplands (known as the Pyrenees Range) and the northern section of the Western Plains. These areas include landscapes developed initially on Palaeozoic sedimentary and granite rocks and subsequently covered by extensive flows of basalt lava.

The subsurface profile of the site is expected to comprise surface residual silts and sands, underlain by moderate to highly reactive clay soils which grade to variably weathered rock with depth. The depth of bedrock may be variable with shallower depths anticipated for newer Volcanic and Devonian geological types and deeper for the Ordovician geology types.

The site contains a number of minor watercourse (including two minor and several ephemeral water courses), brackish lakes, smaller swamps, and wetlands. The majority of the lakes and water bodies are brackish or saline. The land formation of the area features natural depressions that facilitate capturing surface water, resulting in most of the streams being ephemeral. However, many of the soils within the site are highly porous tending to minimise surface water capture.

There are several waterbodies within the vicinity of the proposed wind farm site including Lake Goldsmith, Black Lake, Slater Lake and Buln Gherin Swamp.

Hydrological maps of the site suggest that groundwater flows at the southern area of the site towards the south, and the northern area of the site flows towards the north.

For further details of Land Capability please refer to Section 8 of this report.

FLORA AND FAUNA

A total of 124 plant species, 87 (70%) indigenous and 37 (30%) introduced (including non-indigenous native) have been recorded on site. One threatened flora species, the Golden Cowslips (*Diuris behrii*) (listed as vulnerable within Victoria) was detected in the northern part of the wind farm site. No EPBC Act listed threatened fauna or migratory species were recorded in areas potentially impacted by the proposed wind farm components. The wind farm site supports six faunal habitats.

Fauna recorded on site were mainly native, made up of common farmland (most common species recorded) and bushland birds. 62 bird species were recorded during the assessment, with a small number of birds of prey (including Wedge-tailed Eagle) and waterbirds also observed on the site.

Four mammal species, four reptile species and nine bat species were recorded during the assessment, none of which are threatened. No amphibians were observed on the site. The nationally vulnerable Striped Legless Lizard (*Delma impar*) (including one potentially gravid female which would represent a breeding population) and state listed Fat-tailed Dunnart (*Sminthopsis crassicaudata*) were recorded within the site.

The Golden Sun Moth (threatened species) is expected to occur on site however no moths were found during targeted surveys undertaken.

The Brolga is well known in the Streatham–Skipton area and breeds in smaller, seasonal and permanent wetlands throughout this area. Within 20 km of the boundary of the proposed wind farm, there are at least five historically known Brolga flocking sites (Atlas of Victorian Wildlife records). Up to six breeding pairs are estimated to occur within three kilometres of the wind farm boundary. The total likely annual collision rate of Brolga when the wind farm is in operation is estimated to be 0.2 birds per year. This low risk to Brolgas has been achieved due to the siting of turbines and creation of buffer areas.

Detailed mitigation and monitoring measures have been identified to limit/mitigate the impact of the proposed wind farm on flora and fauna species of the site.

HERITAGE

There are two previously recorded Aboriginal sites within the wind farm site, namely:

- An earth mound located near Nerring (AAV7523-0027); and
- A post-Contact site; the Stockyard Hill Honorary Correspondent Depot (Historic Place Report 5.4-67) identified on the Pyrenees Shire Planning Scheme Heritage Overlay as the Old Homestead at Mawkwallock (HO32).

A total of four historic structures have been previously recorded within the activity area including the Stockyard Hotel ruins (H7522-0001), a Boundary Riders Hut (HO33), the Old Homestead at Mawkwallock (HO32) and the remnants of the Lake Goldsmith School (HO37).

Investigation into the site's history in relation to Aboriginal heritage found that:

- The activity area contains several areas of cultural heritage sensitivity as defined in the Aboriginal Heritage Regulations 2007;
- One small-scale cultural heritage assessment utilising ground surface survey has included part of the activity area (from Mena Park and along Stockyard Hill Road) within its broader boundaries (Richards & Sutherland 1994); and
- An additional 21 Aboriginal archaeological sites have been previously recorded within 5 km of the activity area.

Mawwallock Homestead, a site recognised to be of State significance, is located in proximity to the Stockyard Hill Wind Farm. The site has been recently listed on the Victorian Heritage Register. The gardens, lake and broad landscape around the first and second homesteads of Mawwallock have been specifically identified as culturally significant landscapes. An assessment of the impact of the proposed wind farm on the cultural heritage significance of Mawwallock was undertaken and determined that there would not be an adverse impact on the property as a result of the development of the wind farm.

For further details on Heritage please refer to Section 10 of this report.

TRANSPORT

The primary connector roads accessible to the proposed wind farm site during construction include the Glenelg Highway, Skipton Road and the Western Freeway/Highway. The wind turbine components are likely to be transported by over dimensional vehicles to site on these roads from the Ports of Melbourne or Portland.

Direct access to the wind farm site will be from several VicRoads and Shire regulated access roads, including Beaufort - Carranballac Road, Eurambeen - Streatham Road, Stockyard Hill Road, Streatham - Carngham Road, Mt Emu Road- Settlement Road, Millars Road, Toppers Road, Thompson Road, Frog Hollow Road, Dooley's Road, Dalgleishs Rd, Caramuir Road, Geelong Road and Skipton Road. It is expected that direct access will be required to Skipton Road in up to 12 locations and Geelong Road in up to 10 locations. Both of these roads are included in a Road Zone Category 1.

Turbines will be accessed via a network of internal access roads.

The project will result in an increased vehicle movement during the construction phase however, the existing road network is expected to be able to easily accommodate the additional traffic volumes generated during all stages of the wind farm development.

Mitigation strategies have been designed to minimise the impacts of the construction phase of the proposed wind farm.

For further details on Transport please refer to Section 11 of this report.

ELECTROMAGNETIC INTERFERENCE

The Electromagnetic Interference (EMI) assessment identified that the proposed Stockyard Hill Wind Farm project is unlikely to have any anticipated interferences on MF(Medium Frequency) and FM (Frequency Modulation) sound broadcasting, mobile radio, pay television, air services radio and radio communication services.

Mitigation strategies have been designed to minimise the impacts of the construction of the proposed wind farm on the four point to point links registered within 50 km of the proposed wind farm and television (analogue and digital) reception potentially affected by 'ghosting'.

For further details on Electromagnetic Interference please refer to Section 12 of this report.

SHADOW FLICKER

Shadow Flicker modelling undertaken accommodated for variability of wind and the subsequent orientation of turbines to these winds, in adopting a conservative approach (as items such as cloud cover, low wind speed, vegetation and other shielding effects are not included), a 30 degree direction bin was calculated. Based on this analysis, only two houses, both owned by landowners with an interest in the Stockyard Hill Wind Farm, remained above the 30 shadow flicker hours per year. Therefore, no further monitoring or mitigation measures are required.

For further details on Shadow Flicker please refer to Section 13 of this report.

AIR SAFETY

The Civil Aviation Safety Authority (CASA) is currently reviewing its withdrawn Advisory Circular AC139-18 "Obstacle Marking and Lighting of Wind Farms".

A qualitative risk assessment has been undertaken and, as a consequence, the proposed wind farm is not anticipated to have an impact on aircraft safety, including protected airspace, for the following reasons:

- *The proposed site is located more than 30km from any designated aerodromes;*
- *The height of the turbines are well under the minimum height of Visual Flight Rules;*
- *The site is void of obstacle limitation surfaces; and*
- *The site is located outside navigation air and air traffic control clearance zones.*

As a consequence, SHWF does not propose to install obstacle lighting. However, given that CASA's views on this issue are in flux and that CASA may request in the future that obstacle lighting be installed the impacts of such lighting have been assessed.

For further details on Air Safety please refer to Section 14 of this report.

NOISE

The noise limits prescribed by NZS6808:1998 are predicted to be achieved at all non-host landholder neighbouring properties. 23 of the 25 host landholder properties exceed this limit; however they comply with the ETSU-R-97 recommended noise limits which are considered acceptable for a wind farm development. The remaining two properties which the noise standards can not be reached will be occupied by Stockyard Hill Wind Farm for the life of the project. Therefore, no further mitigation and monitoring measures are required.

For further detail on Noise please refer to Section 15 of this report.

LANDUSE

The primary use of the site is agriculture with the majority cultivated for grazing and cropping. The development of the proposed wind farm will not prevent the site or neighbouring properties from continuing existing agricultural activities. Furthermore, it is accepted that other potential impacts of the proposed wind farm (such as noise and shadow flicker) will not adversely affect livestock.

The majority of existing dwellings located on the wind farm site and in the surrounding area can continue to be occupied and are not expected to suffer significant adverse impacts in terms of noise and shadow flicker or visual amenity (as discussed in greater detail in other sections of this report).

Other land uses located within the vicinity of the proposed wind farm include Goldsmith Steam Rally complex, the Lake Goldsmith Hall and Black Creek Nature Conservation Reserve. There is not expected to be a negative impact on these properties given the nature of the use.

For further details on Land use please refer to Section 16 of this report.

SOCIO ECONOMICS

Regional, state and national economic benefits are expected during the construction and operation phase of the proposed Stockyard Hill Wind Farm. At a state level, it is expected that revenues from the additional demand for goods and services would contribute up to \$145 million per year. This is expected to support between 440 and 665 jobs per year for the period of construction at a state level. During operation up to 84 full-time equivalent jobs would be generated regionally across all industries, of which 32 would be directly related to the operation of the project.

The project will have a number of positive implications for business and industry development in the region including greater private sector investment in the Pyrenees and Corangamite regions.

The proposed wind farm would also increase the demand for local services and infrastructure with suppliers being sourced from larger regional centres such as Ballarat, Ararat, Portland, Warrnambool and Colac, and accommodation for the workers could be serviced through existing vacancy rates. It is also anticipated that the proposed wind farm would have a positive impact on tourism in the area.

SHWF has committed to the establishment of a Community Fund as part of the project. Funds would be spent on community projects that would benefit the local community.

For further details on Socio Economics please refer to Section 17 of this report.

LANDSCAPE AND VISUAL

The Landscape and Visual assessment demonstrates that the proposed Stockyard Hill Wind Farm will have a generally low visual impact on its surrounds and within the broader areas of western Victoria. Furthermore, it is considered that the site is a suitable landscape for the construction of a wind farm as identified below:

Level of visual change of the existing landscape

The proposed Stockyard Hill Wind Farm site is located in a landscape that has been extensively modified since European habitation. The predominant landscape unit within the viewshed of the Stockyard Hill Wind Farm is cleared flat farmland which has a low sensitivity to visual change and is well represented across this area. Agricultural activity, associated structures and other signs of human intervention have also created a landscape that can absorb other changes.

Perception studies continually show that the majority of viewers in this area do not object to the construction of wind turbines on any but the most sensitive and localised landscapes. This is supported by the social research undertaken for other wind farms in the area.

Visual impact from towns

There is low visual impact on townships. Long distance views may be available from the townships of Beaufort to the north and Skipton to the south. There is however minimal visibility of the proposed wind turbines from most areas within Beaufort. There is also minimal visibility of the wind turbines from other settlements in the area.

Visual impact from reserves & parks

The parks and reserves within the vicinity are well vegetated and views to the site are limited from locations within these parks. The most likely visual impact will occur at the edges of these areas and adjacent to the proposed wind farm. There are however, two locations that were assessed where the proposed wind turbines may be a dominant feature in the landscape. These

locations are Mount Emu and Lake Goldsmith. Both of these locations have limited areas of vegetation to assist in filtering views to the proposed wind turbines.

Visual impact on the surrounding road network

The Western Highway to the north and the Glenelg Highway to the south of the wind farm site are the two major roads within the region. Although views are possible from these two highways, the overall impact is expected to be low due to the predominantly low landscape sensitivity, and limited viewing opportunities afforded by topography and vegetation.

There will however, be a visual impact on viewers using the minor roads which run adjacent to, and through the site. Visibility in some locations will be restricted by roadside vegetation, and overall the visual impact is considered low from these locations partly due to the low viewer numbers and the capacity for this rural landscape to absorb further change.

Visual impact on nearby residential dwellings

There are 69 non-participatory residences within 3 km of the wind farm. Many of these existing residences have screening in the form of wind breaks which limit or filter views in the direction of the wind farm site. Further planting can be effective in lessening the visual impact on residential properties without existing screening.

Cumulative Visual Impact

The cumulative visual impact of the proposed Stockyard Hill Wind Farm, when considered with other wind farms in the area, is not expected to be sufficient to change visitor's perception of the broader region. Users of the Western Highway will pass the Stockyard Hill Wind Farm and will also be able to see the Waubra and Chalicum Hills Wind Farms. However, this is not a great change to the views from the Western Highway, as viewing points to the Stockyard Hill Wind Farm are limited.

The level of cumulative visual impact for users of the Glenelg Highway is limited, as there are few opportunities for sequential wind farm views. It is therefore assessed as being a low cumulative impact.

Hazard identification lighting Impact

Hazard identification lighting is not required for the proposed Stockyard Hill Wind Farm according to the Review of Obstacle lighting Requirements – A Risk Assessment, September 2009 prepared by The Ambidji Group Pty Ltd (refer to Section 14 of this report for a summary of this assessment). However, in the event that such lighting is a future requirement an assessment of the likely visual impact has been undertaken and is summarised within Section 18 of this report.

Visual Impact of the proposed powerlines and substations

The landscape through which the proposed powerline is aligned is already highly modified, and contains powerlines and other forms of visual infrastructure. All but two of the viewpoints were assessed as "low" or "low-to-nil" visual impact. The proposed powerline infrastructure is not dissimilar to many of the powerlines already found in the surrounding landscape.

The higher sensitivity ratings of "moderate to high" and "low to moderate" visual impact are in areas where existing native trees will require removal. The rating in these areas is due to the changes in the landscape associated with the potential removal of these trees.

The proposed terminal station site is located approximately 1.4 km from any public roads. There is an existing 500 kV powerline easement that runs along the southern boundary of the proposed terminal station site. There are also blue gum plantations located adjacent to the site's northern boundary and on the southern side of the existing 500 kV powerline. In addition, the terminal station will have a vegetation buffer between 20-50 m around its perimeter, which will effectively screen most of the terminal station components from view. Therefore the proposed terminal station will cause limited visual impact.

For further details of Landscape and Visual Assessment please refer to Section 18 of this report.

HEALTH AND SAFETY

Stockyard Hill Wind Farm is not expected to adversely affect residents or the community in terms of safety issues (such as fire, lightning strike, blade glint and public safety issues). SHWF will utilise mitigation measures (where applicable) in consultation with landholders to minimise adverse impacts, should they occur. An Environmental Management Plan (EMP) will include provisions aimed at avoiding certain operations that may cause additional risk to the health and safety during construction and operation of the proposed wind farm.

For further information on Health and Safety please refer to Section 19 of this report.

PLANNING POLICY ASSESSMENT

The proposed wind farm project complies with both State and Local Planning policies relating to environment, the management of resources, infrastructure, noise abatement, conservation of flora and fauna, heritage, energy efficiency, tourism, agriculture, airfields, design and built form, and greenhouse gas reduction.

The proposed Stockyard Hill Wind Farm will provide a sustainable form of energy for consumption within Victoria. In doing so it will make a valuable contribution to international, national, state and local objectives to control greenhouse gas emissions while supporting broader social, economic and environmental policies.

For further details of the assessment of relevant Planning Policy for the proposed Stockyard Hill Wind Farm please refer to Section 21 of this report.

CUMULATIVE IMPACT

An assessment of cumulative impact was undertaken of all known and seriously entertained proposals for wind energy facilities in proximity to the site. This assessment addressed the cumulative impacts (with consideration of the presence of multiple wind farms in the area) in respect to visual impacts (including changes in perception), cumulative traffic impacts, cumulative noise impacts, and aircraft safety. As a result of this assessment, to minimise potential cumulative impacts SHWF has proposed mitigation and monitoring measures.

For further details on Cumulative Impact please refer to Section 20 of this report.

ENVIRONMENTAL MANAGEMENT PLAN

A framework for the preparation of an Environmental Management Plan (EMP) for the proposed Stockyard Hill Wind Farm, including management tools, protection measures and monitoring regime for the design, construction and operation phases has been prepared and described at Section 22 of this report.

A number of environmental issues were identified following the environmental assessment process undertaken by the proponents. The development and implementation of a comprehensive EMP, supported by a Construction and Environmental Management Plan (CEMP) will help to avoid and or minimise such impacts. It is expected this requirement will be reflected as a permit condition.

For further information on the EMP please refer to Section 22 of this report.

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INTRODUCTION

This report supports an application for a planning permit for the Stockyard Hill Wind Farm project.

A planning permit application is sought for the development and use of the site as a wind energy facility, including the installation of turbines, buildings and other infrastructure used in connection with the generation of electricity. The works include access tracks, underground cables, overhead cables, substations and temporary ancillary concrete batching plants plus the removal of native vegetation and erection of business identification signs (*Annex A – Application Form*).

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Stockyard Hill Wind Farm Pty Ltd (SHWF), a subsidiary of Wind Power Pty Ltd, both of which are wholly owned subsidiaries of Origin Energy Wind Holdings Pty Ltd, which is in turn a member of the publicly listed Origin Energy group of companies, to prepare a Planning Permit Assessment Report for the proposed Stockyard Hill Wind Farm.

This report has been developed in accordance with the *Planning and Policy Guidelines for the Development of Wind Energy Facilities in Victoria* (Wind Energy Guidelines) released by the Department of Planning and Community Development (DPCD) in September, 2009 (*Annex B- Wind Energy Guidelines*).

1.1

PROPOSED DEVELOPMENT

SHWF proposes to develop the Stockyard Hill Wind Farm in south-west Victoria (refer to *Figure 1.1*), which comprises installation of 242 wind turbines and associated on-site infrastructure. The site is located within the Pyrenees Shire and covers an area of approximately 15,617 hectares.

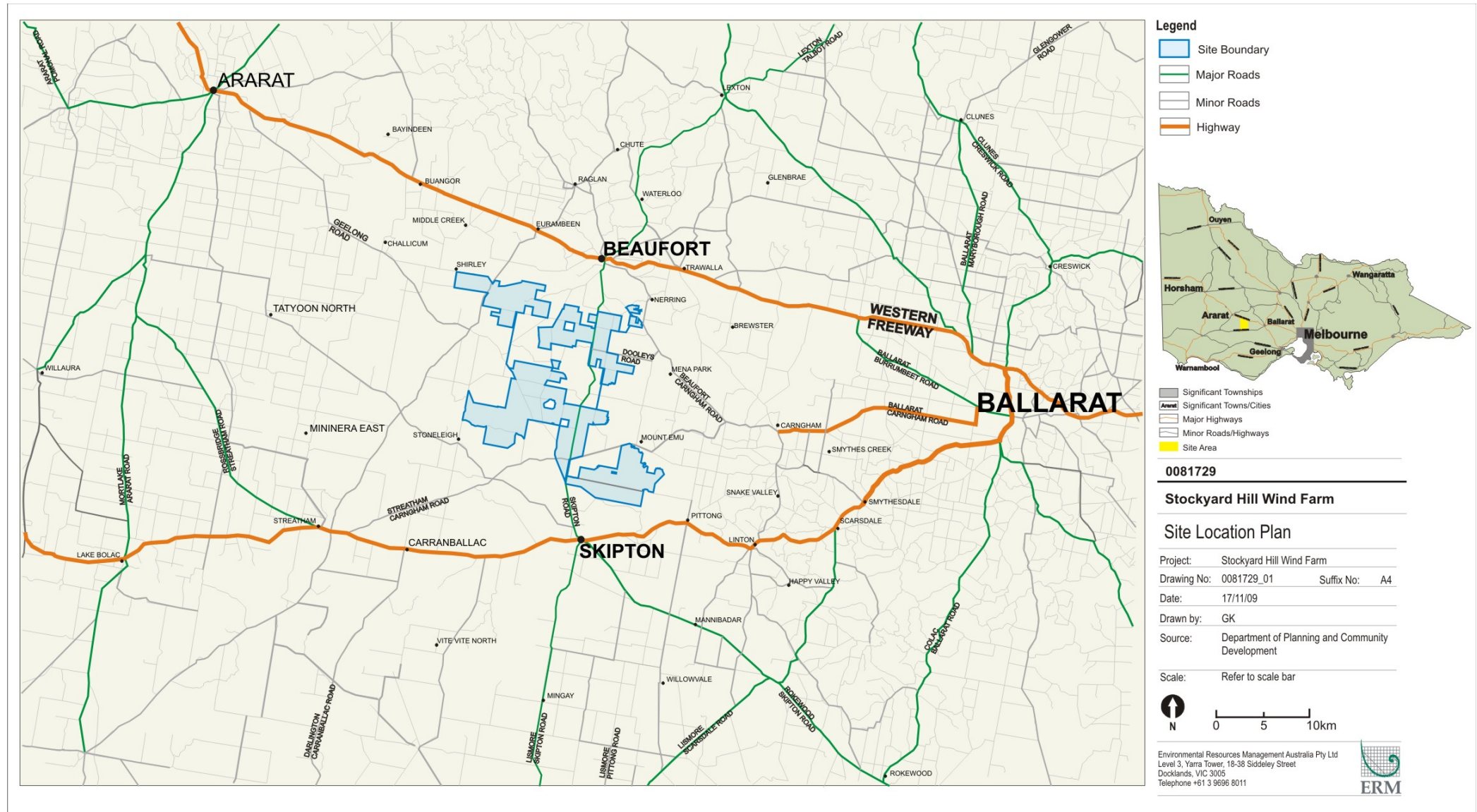


Figure 1.1 Location Plan

The aim of this project is to provide a source of renewable energy to supplement Victorian and National energy needs.

A preliminary energy estimate undertaken by SHWF indicates that this project is expected to generate approximately 1,891 GWh of electricity per year (based on a long term average forecast) which equates to providing the equivalent of more than 270,138 dwellings per year with electricity or approximately 21% of Melbourne homes. It is anticipated that the production of this electricity from renewable sources will result in a reduction of approximately 1,890,969 tonnes of carbon dioxide per year (based on a long term average forecast) (*Annex C- Greenhouse Gas Abatement Report*).

This project will support the Victorian Renewable Energy Target scheme which aims to ensure at least 10% of Victoria's electricity consumption comes from renewable energy sources by 2016, as outlined in the Renewable Energy Action Plan.

In addition, this project will support the Commonwealth Government's commitment to meeting its Kyoto Protocol target (108% cap on CO₂ emissions from 1990 levels) and to achieving the target currently contained in the recently released Carbon Pollution Reduction Scheme White Paper of cutting emissions by 60% by 2050. The project will also contribute to the objective of 20% of renewable electricity by 2020, as stated in the Commonwealth Government's Renewable Energy Target (RET) scheme.

The key facts for the project are summarised in *Table 1.1*.

Table 1.1 *Key facts of the Stockyard Hill Wind Farm*

Key facts of the Stockyard Hill Wind Farm	
Site Area (ha)	15,617
Number of Landholders	55
Number of turbines	242 turbines
Turbine MW Class	2-3 MW
Power Generation (MWh) pa based on a long term average forecast	1,890,969 based on 2 MW turbines)
Capacity Factor	44.6%
Turbine Height	Up to 132 m
Hub Height	Up to 80 m
Rotor Diameter	Up to 104 m

Note: The specifications contained in the table above may be subject to minor variations, depending upon the model of turbine selected by the proponent. For further turbine details refer to Section 4.1.2.

1.2

THE PROPONENT

As identified previously, SHWF is a subsidiary of Wind Power Pty Ltd, both of which are wholly owned subsidiaries of Origin Energy Wind Holdings Pty Ltd (OEWH), which is in turn a member of the publicly listed Origin Energy group of companies. SHWF was until recently owned by Wind Power Pty Ltd and both entities were acquired by Origin Energy on the 6th May 2009.

Origin Energy is one of Australasia's leading integrated energy company focused on gas and oil exploration and production, power generation and energy retailing. Origin has a strong focus on ensuring the sustainability of its operations and is the largest green energy retailer in Australia. It also has significant investments in renewable energy technologies.

During the preparation of this planning permit application SHWF has been supported by the following consultants:

- ERM has undertaken an environmental assessment of the project and provided environmental advice on a range of matters including planning, government policy, landuse and landscape and visual impacts. In addition, ERM was responsible for the compilation and submission of this planning permit application;
- Brett Lane & Associates Pty Ltd (Brett Lane) has undertaken an assessment of the ecological features of the site with specific studies of Brolgas, bats, Golden Sun Moths, Striped Legless Lizards and flora;
- Biosis Research has undertaken a Brolga collision risk management assessment and assessment of the powerline route and its effect on Brolgas;
- Tardis Enterprises Pty Ltd has undertaken a preliminary desktop cultural heritage assessment and has also prepared a Cultural Heritage Management Plan (CHMP) which has been submitted;
- The Ambidji Group has been advising SHWF on aircraft safety and obstacle lighting;
- Laurie Derrick & Associates has undertaken a telecommunications and electromagnetic interference assessment;
- Marshall Day Acoustics Pty Ltd has undertaken a noise assessment;
- Parsons Brinkerhoff (PB) has undertaken a traffic and transport assessment as well as a socio-economic assessment;
- URS has undertaken a surface water and groundwater assessments;
- Allan Willingham has undertaken an assessment of the cultural heritage significance of Mawallok Homestead;
- The University of Melbourne has undertaken an assessment to predict the impacts of the proposed wind farm on the Victorian Brolga population;
- Environmental GeoSurveys Pty has undertaken an assessment of the geology, geomorphology and geoscience values of the wind farm site;
- Garrad Hassan has undertaken a shadow flicker and blade glint assessment; and
- Hard Rock Geotechnical Pty Ltd has undertaken a geotechnical review of the study area.

The key contact for this project is as follows:

Mr Vaughan Hulme
Development Executive
Stockyard Hill Wind Farm Pty Ltd
Phone: (03) 9652 5200
Fax: (03) 9819 0120
StockyardHillWindFarm@originenergy.com.au or info@wind-power.com.au

Postal address:

Stockyard Hill Wind Farm Pty Ltd
Level 3, 765 Glenferrie Road
Hawthorn
Victoria 3122

1.2.1 Further Information

Further information and project updates are available at
www.stockyardhillwindfarm.com.au or www.wind-power.com.au

Further information on the proponent is available on OEWH's website
www.originenergy.com.au

1.2.2

Environmental Policies

The relevant companies' environmental policies are:

Origin's Environmental Policy


Policy

Health, Safety & Environment

At Origin Energy, we value the wellbeing of our employees, contractors, customers, the communities in which we operate and the environment. We are committed to responsible management practices that minimise any adverse health, safety or environmental impacts arising from our activities, products or services.

We have in place a Health, Safety and Environmental management system for all our activities that drives continual improvement. The HSE Management System outlines HSE accountabilities to implement this Policy and requires that we:

- Identify and manage risks to as low as reasonably practicable where they have the potential to cause an accident, injury or illness to people, or unacceptable impacts on the environment or the community;
- Provide safe work places and systems of work, empower employees and contractors to address unsafe or hazardous situations and carry out their work in a manner that does not present a risk to themselves, others or the environment;
- Support the recovery and rehabilitation of employees in the event of work related injury or illness;
- Set objectives and targets which promote the efficient use of energy and resources, the minimisation of wastes and emissions and the prevention of pollution;
- Ensure compliance with relevant HSE legal requirements and other commitments;
- Require Contractors to manage HSE using standards and practices that accord with this Policy;
- Regularly review and report HSE performance.

In implementing this Policy we will engage with our employees, contractors, suppliers, business partners, customers and Government and communicate expectations to all persons working with or on behalf of Origin Energy.

Accountabilities

The Board is responsible for establishing and overseeing the Company's commitment to manage HSE in accordance with this Policy and for monitoring the performance of the Company with respect to its implementation.

The Managing Director is responsible for the implementation of the HSE Management System to ensure the commitments made in this Policy are being met.



Grant King
Managing Director
 September 2007
 Review date September 2009

SHWF Environmental Policy

SHWF aims to provide leadership in managing the impacts of our activities and will continually strive to set an example of best practice environmental management. SHWF recognises the value of the environment to the community and future generations.

SHWF is continually committed to:-

- *Identifying all environmental aspects and impacts of our operations through regular reviewing and internal auditing*
- *Continual improvement in environmental management practices and performance;*
- *Communicating openly and transparently with appropriate parties on environmental matters;*
- *Managing land under our care with sensitivity, having due regard for local environment and cultural sensitivities;*
- *The use of the latest or most appropriate technology in order to maximise power output whilst having due consideration for the environmental impact of our activities, products and services;*
- *Complying with all environmental legislation and other requirements which relate to its environmental aspects, including the Clean Energy Council Best Practice Guidelines;*
- *Educating employees and contractors (any persons performing a task for the organisation or on it's behalf) to conduct their activities in an environmentally responsible manner;*
- *Ensuring this policy is readily available to the public, maintained and communicated to all persons working for or on behalf of this organisation, and is periodically reviewed;*
- *Continuing to refine and continually improve our Environmental Policy and environmental objectives and targets.*

The SHWF Environmental Management System provides the framework for developing, implementing, monitoring and reviewing environmental objectives, actions and targets as set out in our environmental plans and programs. These objectives and targets drive our management programs and focus our commitment to continual improvement in environmental performance, as measured by our internal audits along with our environmental objectives and targets.

1.3

APPROVAL PROCESS

A planning permit is required to develop and use the Stockyard Hill Wind Farm.

A copy of the permit application form is contained in *Annex A – Application Form*.

The approvals process relevant to this application is detailed within the Wind Energy Guidelines (*Annex B – Wind Energy Guidelines*). An outline of the process relevant to the Stockyard Hill Wind Farm is identified within *Figure 1.2* on the following page.

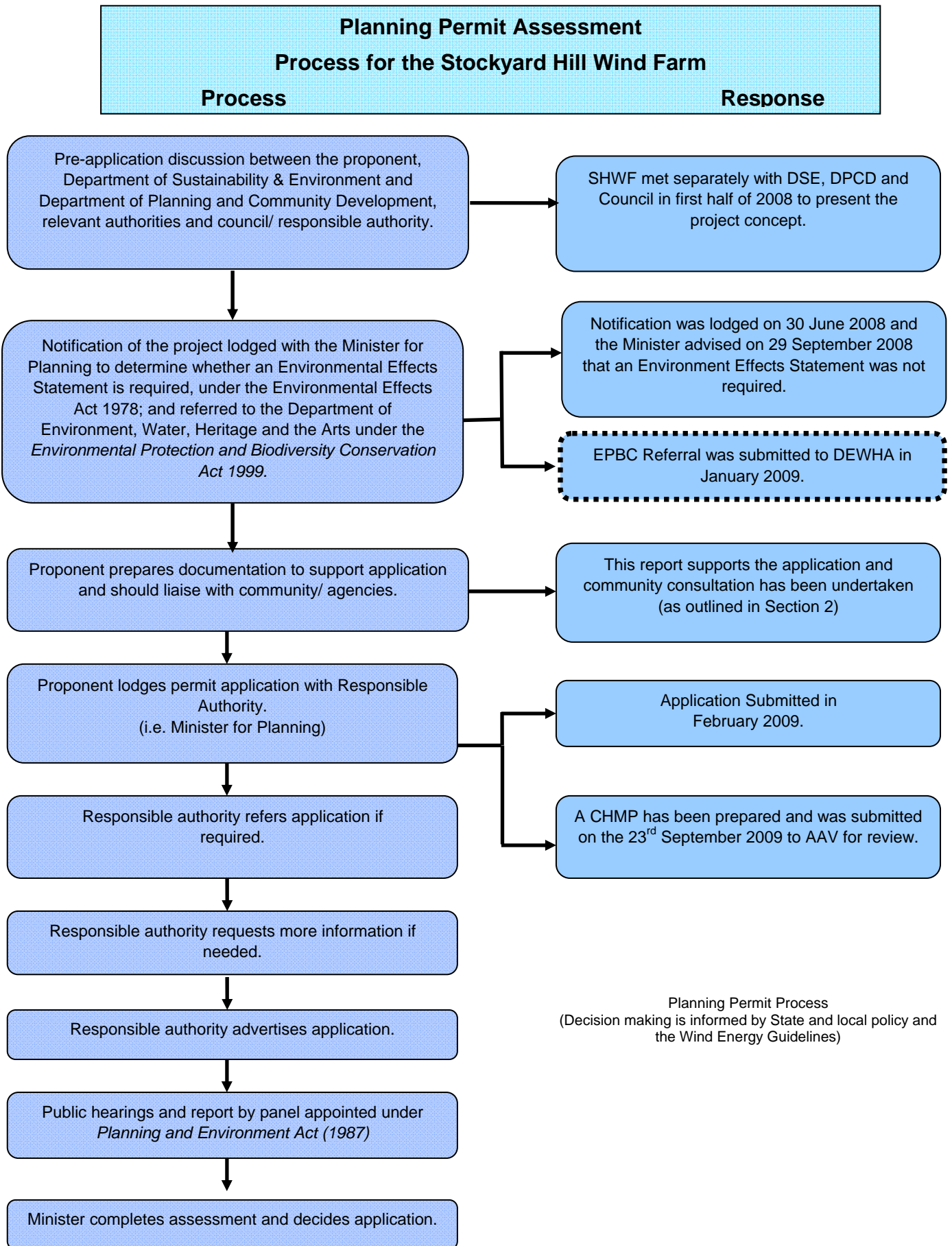


Figure 1.2 Relevant Planning Process (Other key Commonwealth, State and local legislation relevant to the approvals process are detailed below.)

1.3.1

Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The Department of the Environment, Water, Heritage and the Arts (DEWHA) is responsible for determining whether development activities are likely to have a significant impact on matters of national environmental significance under the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

An EPBC Referral relating to the proposed wind farm and associated infrastructure (including the proposed Terminal Station and powerline route) was submitted to and registered by DEWHA on the 28th January 2009. On the 15th July 2009 DEWHA, on behalf of the Commonwealth Minister for the Environment, determined that the proposed Stockyard Hill Wind Farm is a '*controlled action*' pursuant to the following sections of the Act.

- Listed threatened species and communities (Sections 18 and 18A); and
- Listed migratory species, (Sections 20 and 20A).

DEWHA determined that based on the information submitted as part of the referral, the proposed wind farm is likely to have a significant impact for the following reasons:

- *It is likely to lead to the loss of individuals of EPBC – listed migratory bird species that utilised Lake Goldsmith, in particular the Sharp-tailed Sandpiper, through collision with wind turbines.*
- *It is likely to result in the removal and disturbance of potential habitat for the critically endangered Golden Sun Moth and an important population of Striped Legless Lizard, and may also result in the direct loss of individuals of these species.*

As such the proposed wind farm will be assessed, for the purposes of the EPBC Act, under a process accredited by the new bilateral agreement, under Section 45 of the Act, between the Commonwealth and State Governments whereby assessment pursuant to the Act is undertaken through a State process.

Therefore, assessment will be carried out under the P&E Act where the proposed method of assessment will be by way of an Advisory Committee. The Victorian Minister for Planning specifies terms of reference for the Advisory Committee, to ensure that all relevant impacts are assessed and that the Committee prepares a report which is sufficient for the Commonwealth Minister to make a decision under the EPBC Act. It is expected that the required Terms of Reference will be advertised and a subsequent report will be prepared on behalf of the proponent to respond specifically to the terms of reference.

1.3.2

Environmental Effects Act 1978 (Vic)

The *Environment Effects Act 1978 (EE Act)* provides for the environmental impact assessment of proposals with potentially significant effects on a State level. The Act outlines a procedure for the potential environmental impacts of a proposed development to be carefully assessed before any decision is made on the development.

The Minister for Planning is responsible for administering the *EE Act* and for deciding whether an Environmental Effects Statement (EES) is required under this Act.

SHWF submitted an EES Referral on the 30th June 2008 to the Victorian Minister for Planning, to confirm whether an EES was required for the project.

The Minister decided on 29th September 2008 that the project does not require an EES, subject to the three conditions identified below:

- *A report is to be submitted to the Minister for Planning on the potential effects of the Stockyard Hill Wind Farm on the Victorian Brolga population and offsetting measures needed to address adverse effects. The report is to use a population viability analysis approach or other suitable methodology endorsed by the Department of Sustainability and Environment (DSE) and is to be prepared to the satisfaction of the Secretary of DSE or delegate;*
- *A report is to be submitted to the Minister for Planning on the potential effects of the Stockyard Hill Wind Farm on the cultural heritage significance of Mawallok. This report is to take into account the statement of cultural heritage significance prepared by Heritage Victoria and identified by Victorian Heritage Number PRO V H0563 and must be prepared to the satisfaction of Heritage Victoria; and*
- *A report identifying corridor options for an extension of the national electricity grid to the Stockyard Hill Wind Farm site, and assessing sensitivities with respect to landscape and fauna values, including potential impacts on Brolga, is to be prepared to the satisfaction of the Secretary of the Department of Planning and Community Development, or delegate, and submitted to the Minister for Planning.*

The required assessments were prepared and submitted to the Minister for Planning for review. On the 16th September 2009 the Minister determined that the three conditions, listed above, had been 'satisfactorily met' (refer to *Annex D- Ministers EES Decision*). The above issues are discussed in more detail within later sections of this report.

The Minister also determined that the proposed Stockyard Hill Wind Farm project should be assessed under *the Planning and Environmental Act 1987 (PE Act)*. These guidelines are included at *Annex B – Wind Energy Guidelines*.

1.3.3 *Planning and Environmental Act 1987 (Vic)*

The purpose of the *Planning and Environment Act 1987* is to establish a framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians.

The *Planning and Environment Act 1987* requires that a planning framework, termed a Planning Scheme, be established for all land within Victoria. A Planning Scheme is a statutory document which sets out objectives, policies and provisions relating to the use, development, protection and conservation in the area to which it applies, which in this case is the Pyrenees local government area.

1.3.4 *Pyrenees Planning Scheme*

The majority of the site is zoned 'Farming' by the Pyrenees Planning Scheme (the Scheme). Under the Scheme a wind energy facility is a Section 2 Use and, therefore, a planning permit is required to develop or use the land for this purpose.

The Victorian Minister for Planning is the responsible authority for considering this permit application as he is the responsible authority for wind farm projects that have a generating capacity of greater than 30MW, as defined by Clause 61.01 - Schedule 1 of the Scheme.

As identified above, the assessment process under the *PE Act* relevant to this application is identified within *Figure 1.2*.

Planning Permit under Clause 52.17 of the Pyrenees Planning Scheme for Native Vegetation Removal

A permit is required to remove, destroy or lop native vegetation in the Farming Zone. As the proposal involves the removal of native vegetation, a permit is required under this Clause.

Planning Permit under Clause 52.29 of the Pyrenees Planning Scheme for Land Adjacent to a Road Zone, Category 1.

A small proportion of the site is located within a Road Zone Category 1. Under this zone a planning permit is required to alter or create new access points to designated roads, therefore a permit is required to create and alter access to Skipton and Geelong Roads.

Planning Permit under Environmental Significance Overlay of the Pyrenees Planning Scheme.

Part of the main wind farm site is located within an Environmental Significance Overlay – Schedule 1 (ESO1). This overlay relates to the local designated water supply catchment and borehole areas and aims to protect supply and quality of the potable water supply for surrounding farmland and townships. Examples of issues relevant to this overlay include pollution, surface water disruption, erosion and sedimentation. A planning permit is required under the overlay to:

- *Remove, destroy or lop more than one hectare of vegetation, or vegetation that is within thirty metres of a waterway, water body or water supply channel; or*
- *Construct a building or construct or carry out works if the building or works are:*
 - *within 100 metres of a waterway, spring or bore, or within 300 metres of a water body or water supply channel;*
 - *will generate wastewater or increase or potentially increase wastewater generation and will not be connected to reticulated sewerage;*
 - *are within six metres of an effluent disposal field;*
 - *include a site cut or fill of greater than one metre in depth or greater than 300 square metres in area;*

- are for the construction or enlargement of a dam or swimming pool; or
- are to facilitate intensive animal husbandry, aquaculture or horticulture.

As the proposed wind farm will involve works located within the overlay, a permit is therefore required pursuant to this Overlay.

1.3.5 *Flora and Fauna Guarantee Act 1988 (VIC)*

In accordance with this Act, a Protected Flora Licence or Permit is required for activities on public land which might kill, injure or disturb protected native plants.

Protected floras are native plants or communities of native plants that have legal protection under the Flora and Fauna Guarantee Act 1988.

The protected Flora list includes plants from three sources:

- Plant taxa (species, subspecies or varieties) listed as threatened under the Flora and Fauna Guarantee Act 1988;
- Plant taxa belonging to communities listed as threatened under the Flora and Fauna Guarantee Act 1988; and
- Plant taxa which are not threatened but require protection for other and are declared by Order in Council to be protected flora.

The proposed wind farm development may (subject to detailed design) require the removal of native vegetation within some road reserves. If the vegetation to be cleared includes protected vegetation a permit/licence will be applied for as part of a separate application.

1.3.6 *Other Approvals*

In addition to this permit application for the main wind farm components, further development approvals are required under the *PE Act* in order to facilitate the Stockyard Hill Wind Farm project.

Following consultation with the Department of Planning and Community Development (DPCD) a separate planning application has been prepared for the removal of native vegetation to facilitate the development of a 132kV powerline route to connect the proposed wind energy facility to the National Electricity Grid. A further planning application has also been prepared for the development of a 132/500kV terminal station to reticulate electricity generated by the Stockyard Hill Wind Farm to the National Electricity Grid.

It is important to note that although part of the proposed 132kV powerline route is also located within the Pyrenees Shire, the development of this section does not require the removal of any native vegetation.

A site context plan showing the proposed main electrical components of the Stockyard Hill Wind Farm are included at *Figure 1.3*. Full details of all components are detailed within later sections of this report.

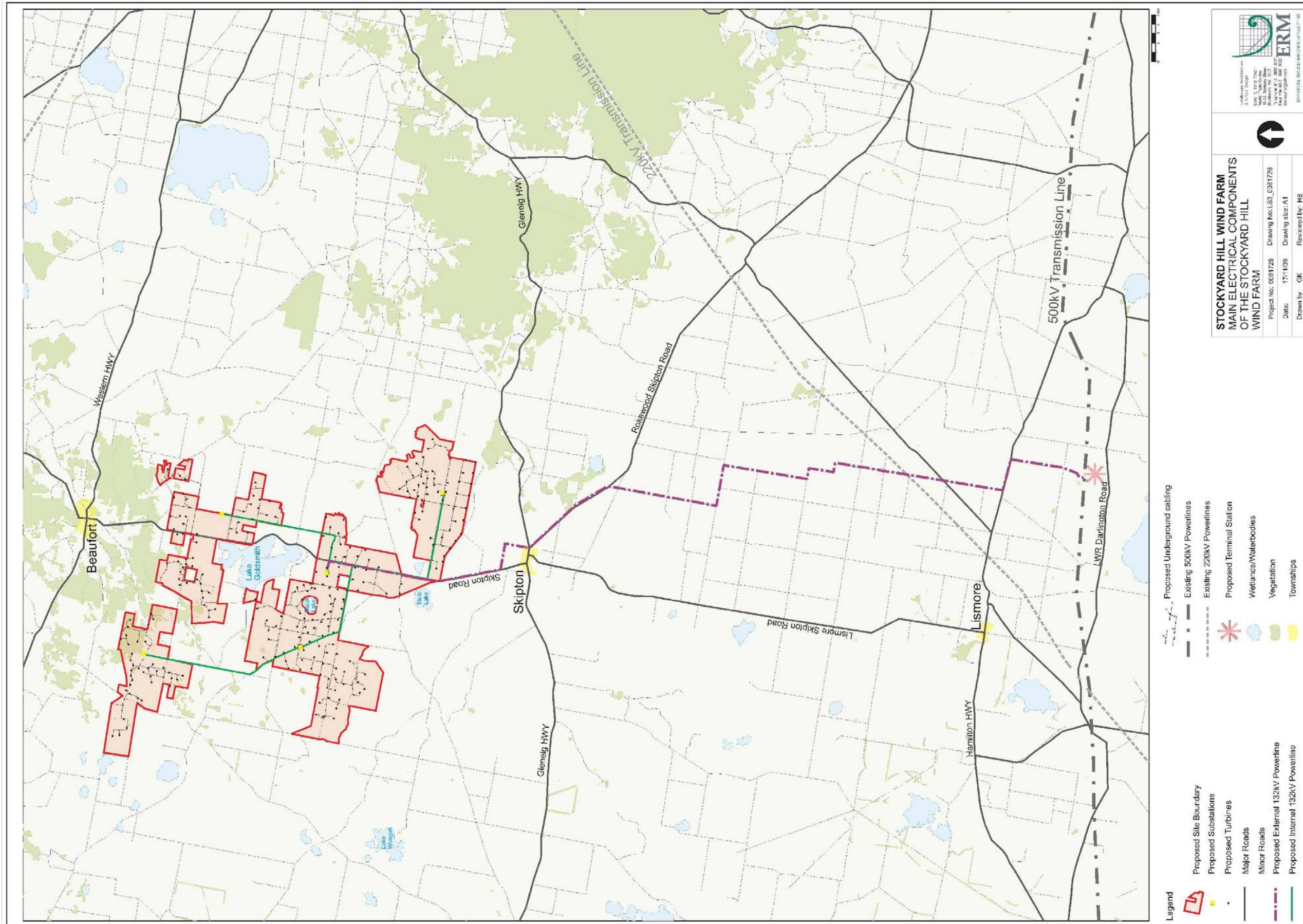


Figure 1.3 Main Electrical Components of the Stockyard Hill Wind Farm

1.4 WIND ENERGY GUIDELINES (2009)

This application has been prepared in accordance with the Application Requirements detailed within the *Wind Energy Guidelines, September 2009 (Annex B)*. Table 1.2 outlines the requirements as specified at Section 4.8 & 4.9 of the guidelines and identifies which Section of this report provides the necessary information.

Table 1.2 Wind Energy Guidelines - Application Requirements Compliance

<i>Application requirements</i>	<i>Details</i>	<i>Section/Figure</i>
Site Analysis	<p>The site:</p> <ul style="list-style-type: none"> • Shape, dimension and size • Orientation and contours • Access to infrastructure • The existing use and siting of buildings or works on the land • Existing vegetation • Landscape of the site • Flora and fauna (listed under the FFG and EPBC Act) • Sites of cultural heritage significance • Wind characteristics • Other notable features <p>The surrounds;</p> <ul style="list-style-type: none"> • Existing land use • Direction and distances to nearby dwellings, townships, urban areas, significant conservation and recreation areas, major roads, tourist routes, airports, aerodromes and other existing and proposed wind energy facilities • Siting and use of buildings on adjacent properties • Location of all dwellings within a 500 metre radius of the site • The landscape including all significant landscape features • Views to and from the site including views from existing dwellings, major roads, walking tracks and tourist routes • Flora and fauna including significant species under the FFG and EPBC Act, including significant habitat corridors for the movement of these fauna • Sites of cultural heritage significance • National Parks and land subject to the <i>National Parks Act 1975</i> • Other notable features of the area 	<p>1.1 & Figure 1.1 3.1 & Figure 3.1 3.9 3.3 3.6 3.7 3.6 3.8 3.11 3 3.3 3 & Figure 3.1 3.3 3.3 & Figure 3.1 18 18 9 10 18.6.5 3</p>
Location Plan	<p>Full site area Local electricity grid Access roads to the site</p>	<p>1.1 & Figure 1.1 & Figure 1.3 1.3.6 & Figure 1.3 11 & Figure 3.1</p>

<i>Application requirements</i>	<i>Details</i>	<i>Section/Figure</i>	
Development Plan	Detailed plans of the proposed development:		
	<ul style="list-style-type: none"> Layout of the turbines & associated buildings and works (this can include anemometers) Proposed connections to the electricity grid Access roads on the site 	4 & Figure 4.1 4.1.12 & Figure 1.3 11 & Figure 4.1	
	Accurate visual simulations showing the appearance of the development in the context of the surrounding area and from key public view points (photomontages)	18	
	Rehabilitation plan for the site, including plans for revegetation and regeneration works	4.1.7 and Figure 4.12	
Written Report	A written response that explains how the proposed design derives from and responds to the site analysis.	5	
	Description of the project:		
	<ul style="list-style-type: none"> Number, location and specification of turbines Amount of electricity to be exported Expected greenhouse gas savings Infrastructure requirements including proposed electricity grid connection Traffic movements 	4 & Figure 4.1 6 6 4 & Figure 4.1 11	
	How the proposal responds to any significant landscape features for the are identified in the planning scheme	18	
	Assessment of the visual impacts of the proposal on the landscape	18	
	Assessment of impacts on avifauna listed in the FFG and EPBC	9	
	Assessment of the noise impacts in accordance with NZ6808:1998	15	
	Assessment of the impacts upon Aboriginal and non-Aboriginal cultural heritage	10	
	Site suitability:		
	<ul style="list-style-type: none"> SPPF, LPPF and MSS Contribution of the proposal to increasing Victoria's diversity of and security of energy supply (including the contribution to minimising greenhouse emissions) Economic and social impacts of the proposal Suitability of the site compared to other sites in the area Amenity effects on the surrounding area due to blade glint, shadow flicker, overshadowing and electromagnetic interference 	21.0 6.0 17 5 12, 13 & 19	
	<ul style="list-style-type: none"> Extent to which the proposal has been designed to manage any potential adverse impacts Impact on aircraft safety (include CASA's view if within 30 km of an airfield or if turbines are more than 110metres in height) Cumulative effects (having regard of other turbines in the area) 	5 14 20	
	EMP	Principles of environmental management	22
		Environmental mitigation measures	22
Standards to be met		22	
Monitoring requirements		22	
Decommissioning and rehabilitation requirements		22	
Post construction adaptive management measures under FFG and EPBC Act		22	

<i>Application requirements</i>	<i>Details</i>	<i>Section/Figure</i>
Matters for Consideration Contribution to government policy	Planning should facilitate renewable energy development in appropriate locations.	3 & 5
	Planning should consider the economic and environmental benefits to the broader community of renewable energy generation and the effects on the local environment.	17
	When planning for wind energy facilities, planning should: <ul style="list-style-type: none"> Facilitate the consideration of wind energy development proposals; 	5 & 7
	<ul style="list-style-type: none"> Recognise that economically viable wind energy facilities are dependant on locations with consistently strong winds over the year and that such sites may be highly localised; and Renewable Action Plan, July 2006. 	4 7
Visual Amenity	Magnitude of landscape change caused by the development: <ul style="list-style-type: none"> Visibility of the development 	18
	<ul style="list-style-type: none"> Location and distance from which the development can be viewed 	18
	<ul style="list-style-type: none"> Significance of the landscape as described in a planning scheme overlay or relevant strategic study 	18
	<ul style="list-style-type: none"> Landscape values associated with adjacent National Parks and land subject to the <i>National Parks Act 1975</i> 	18
	<ul style="list-style-type: none"> The sensitivity of the landscape change 	18
	Visual Impact: <ul style="list-style-type: none"> Number, height, scale, spacing, colour and surface reflectivity of the turbines 	4
	<ul style="list-style-type: none"> The quantity and characteristics of lighting, including aviation obstacle lighting 	18
	<ul style="list-style-type: none"> Avoidance of visual clutter caused by turbine layout and availability to view through a cluster or array of turbines in an orderly manner 	5 & 18
	<ul style="list-style-type: none"> Removal or planting of vegetation 	9
	<ul style="list-style-type: none"> Location and scale of other buildings and transmission lines 	4
	<ul style="list-style-type: none"> Proximity to sensitive areas 	18
	<ul style="list-style-type: none"> Proximity to an existing or proposed wind energy facility having regards to cumulative visual effects 	18 & 20
	Features of the landscape <ul style="list-style-type: none"> Topography of the land 	3 & 18
	<ul style="list-style-type: none"> Amount and type of vegetation 	9
<ul style="list-style-type: none"> Natural features such as waterways, cliffs, escarpments, hills, gullies and valleys 	3, 9 & Figure 3.1	
<ul style="list-style-type: none"> Visual boundaries between major landscape types 	18	
<ul style="list-style-type: none"> Type, pattern, built form, scale and character of development including roads and walking tracks 	4 & 18	
<ul style="list-style-type: none"> Flora and fauna habitat 	9	
<ul style="list-style-type: none"> Cultural heritage sites 	10	
<ul style="list-style-type: none"> The skyline 	18	

<i>Application requirements</i>	<i>Details</i>	<i>Section/Figure</i>
	<p>Evaluation:</p> <ul style="list-style-type: none"> • Planning scheme objectives (include ESO, VPO, SLO) • Contribution to Government policy objectives for the development of renewable energy <p>Impact reduction:</p> <ul style="list-style-type: none"> • Siting and design to minimise impacts on views from recreation areas and from dwellings • Locating turbines to reflect dominant topographic or cultural features • Using techniques such as colour to reduce impacts from key public view points • Limiting night lighting to that required for safe operation of a wind energy facility and for aviation safety • Reducing the number of wind turbines with obstacle lights while not compromising aviation safety • Reducing light glare from obstacle lighting through appropriate mitigation such as baffling • Selecting turbines that are consistent in height, look alike and rotate the same way • Spacing turbines to respond to landscape characteristics • Undergrounding electricity lines where ever possible • Minimise earthworks and protecting drainage lines and waterways • Minimising the removal of vegetation • Avoiding additional clutter on turbines such as advertising and telecommunications apparatus 	<p>7 & 21 6 & 21</p> <p>18 18 18 14 & 18 14 & 18 14 & 18 4.1 & 18 5 & 18 4 8 9 5</p>
Amenity	<p>Noise:</p> <ul style="list-style-type: none"> • Compliance with NZ6808: 1998 <p>Blade Glint:</p> <ul style="list-style-type: none"> • Blade surface treatment to reduce reflectivity <p>Shadow flicker:</p> <ul style="list-style-type: none"> • Shadow flicker to any house < 30hrs/annum <p>EMI:</p> <ul style="list-style-type: none"> • Avoid turbines in the line of sight between transmitters and receivers <p>Aircraft safety:</p> <ul style="list-style-type: none"> • Consultation with CASA is required for proposals that are within 30 km of a declared airfield, infringe the obstacle limitation surface around a declared aerodrome or include a building or structure which exceeds 110 metres or more above natural ground level. <p>The following impact reduction measures may be considered (subject to CASA requirements and advice):</p> <ul style="list-style-type: none"> • Reducing the number of wind turbines with obstacle lights • Specifying an obstacle light that minimises light intensity at ground level • Specifying an obstacle light that matches light intensity to meteorological visibility • Reducing light glare from obstacle lighting through appropriate mitigation such as baffling 	<p>15 19 & 20 13 12 14 14 & 18 14 & 18 14 & 18 14 & 18</p>

<i>Application requirements</i>	<i>Details</i>	<i>Section/Figure</i>
Flora and Fauna	Consider:	
	• Species and communities are protected under FFG and EPBC Act	9
	• The sensitivity of any protected species to disturbance	9
	• Potential loss of habitat to species protected under the FFG and EPBC Acts	9
	Flora and fauna surveys:	
	• Environment Australia to determine for EPBC species	9
	Surveys to indicate risks	9
EMP to minimise risks	22	

1.5

SUPPORTING DOCUMENTATION

The planning permit application for the Stockyard Hill Wind Farm is supported by the following technical reports:

- *Stakeholder and Community Consultation Report*, (SHWF Pty Ltd, September 2009);
- *Greenhouse Gas Abatement Report*, (SHWF Pty Ltd, October 2009);
- *Stockyard Hill Wind Farm - Planning Assessment*, (Environmental Resources Management, October 2009);
- *Stockyard Hill Wind Farm - Planning Application Report Landscape and Visual Assessment*, (Environmental Resources Management, October 2009);
- *Stockyard Hill Wind Farm - Flora and Fauna Assessment*, (Brett Lane and Associates, September 2009);
- *Modelled Risk of Brolga Collisions with Turbines at the proposed Stockyard Hill Wind Farm*, (Biosis Research, September 2009);
- *Evaluating risk of Brolga collisions with powerlines for the proposed Stockyard Hill Wind Farm*, (Biosis Research, September 2009);
- *Predicting Impacts of the Stockyard Hill Wind Farm on the Victorian Brolga Population*, (The University of Melbourne, May 2009);
- *Stockyard Hill Wind Farm - Geology, Geomorphology and Geoscience Values*, (Environmental GeoSurveys Pty Ltd, September 2008);
- *Stockyard Hill Wind Farm – Desktop Review – Groundwater and Surface Water*, (URS, November 2008);
- *Desktop Review- Groundwater and Surface Water – Stockyard Hill Wind Farm (Letter)* (URS, June 2009);
- *Desktop Review- Groundwater and Surface Water – Stockyard Hill Wind Farm (Letter)* (URS, October 2009);
- *Stockyard Hill Wind Farm - Noise Impact Assessment*, (Marshall Day Acoustics, June 2009);
- *Stockyard Hill Wind Farm – Socio-Economic Assessment*, (Parsons Brinckerhoff Australia Pty Ltd, November 2008);

- Stockyard Hill Wind Farm – *Traffic Management Plan*, (Parsons Brinckerhoff Australia Pty Ltd, November 2008);
- *Shadow Flicker Assessment for Stockyard Hill Wind Farm*, (Garrad Hassan Pacific Pty Ltd, January 2009);
- Stockyard Hill Wind Farm – *Investigation of Possible Impacts on Broadcasting and Radio Communications Services* (Lawrence Derrick & Associates, October 2008);
- *Geotechnical Review*, (Hardrock Geotechnical Pty Ltd, October 2008);
- Stockyard Hill Wind Farm – *Desktop Cultural Heritage Assessment*, (Tardis Enterprises, December 2008);
- Stockyard Hill Wind Farm, *Review of Obstacle Lighting Requirements- A Risk Assessment*, (The Ambidji Group Pty Ltd, September 2009);
- *Heritage Impact Statement - Proposed Stockyard Hill Wind Farm*, (Allan Willingham, December 2008); and
- *Addendum to Heritage Impact Statement - Mawallok and the Stockyard Hill Wind Farm*, (Allan Willingham, January 2009).

The reports listed above are included within *Annex C to Z*.

2

CONSULTATION

This Section of the report identifies and provides an overview of SHWF's approach to consultation for the Stockyard Hill Wind Farm project. A summary of the consultation undertaken to date is also provided.

A *Community Consultation Strategy (SHWF, 2008)* was developed by SHWF to guide consultation with identified stakeholders through the life of the project. This Strategy now forms an Annex to the *Stakeholder and Community Consultation Report (Annex E)* prepared to provide a summary of the consultation process, events held and issues raised up to September 2009.

These reports also provide details of the community consultation strategy and process undertaken for the proposed terminal station and 132kV powerline route; however, as these elements form part of separate planning permit applications it has not been included within the discussions below.

2.1 CONSULTATION APPROACH

SHWF recognises the importance of community consultation at each stage of the planning and development process of the Stockyard Hill Wind Farm.

SHWF believes the main aim of undertaking consultation is to understand community issues so that they can inform and shape the project. The approach also recognises that community consultation should inform the community about the project, identify key issues and opportunities and provide a mechanism for feedback that should be considered as part of the design and development process.

2.1.1 Consultation Objectives

Within the *Stakeholder and Community Consultation Strategy (Annex E)*, SHWF identified the main objectives of undertaking community consultation as follows:

- *To educate stakeholders and interested members of the public about the wind farm development and its potential benefits to the community.*
- *To minimise false beliefs and misconceptions regarding the environmental and ecological impact of wind farms.*
- *To listen and respond to community opinions and concerns.*
- *Establish a Community Reference Group and provide accurate information to the community.*
- *To have balanced media coverage where several messages can be conveyed including; SHWF is listening to the community, boosting the local economy, cares about the environment, and is committed to undertaking extensive research.*

2.1.2 Key Stakeholders

Research and experience with other wind farm projects has resulted in SHWF identifying and consulting with the key stakeholders listed below.

Local Community

- Residents in and around the project area including participating landowners, neighbouring residents (to within 5 km of project boundary) and residents of Beaufort, Skipton and Snake Valley.
- Residents and landowners of the nearby townships of Ballarat, Ararat and Lismore.

Non- Government Organisations

- Guardian group(s) such as the Western Plains Landscape Guardians Association.
- Local tourism businesses and operators (e.g. Blacks Creek Farm Accommodation, Beaufort Lake Caravan Park etc).
- Local community services such as CFA, local schools, health services, Masons, Rotary and Lions Clubs and Tourist Information Centre (Beaufort).
- Ecological and environmental activists/organisations such as Bird Observation & Conservation Australia (BOCA).
- The National Trust and Heritage Australia.
- Supporters of renewable energy such as Hepburn Renewable Energy Association and Greenpeace.
- The media including local and metropolitan print and broadcast (local).
- Local Indigenous community including the Ballarat and District Co-op and the Wutherong Aboriginal Corporation.

Government Agencies

- The Pyrenees Shire Council, the Corangamite Shire Council and the Ararat Rural City Council.
- Department of Sustainability and Environment (Environmental Assessment, Regional, and Flora and Fauna Branches) (DSE).
- Department of Planning and Community Development (DPCD).
- Department of Innovation, Industry and Regional Development (DIIRD).
- Department of Defence (DoD).
- Sustainable Energy Authority Victoria (SEAV).
- Heritage Victoria (HV).
- Parks Victoria.
- Vic Roads.
- State Ministers including the Ministers for Agriculture, Rural and Regional Development, Energy and Resources, Environment and Climate Change and the Minister for Planning.
- Aboriginal Affairs Victoria (AAV).
- Office of the Renewable Energy Regulator.

Other Organisations and Agencies

- Electricity transmission authorities (Powercor, VENcorp, SP Ausnet).
- Air services and Civil Aviation Safety Authority (CASA).
- Country Fire Authority (CFA).

For further details on the stakeholders consulted refer to Stakeholder and Community Consultation Strategy (*Annex E*).

2.1.3

Strategic Approach to Consultation

Within the *Stakeholder and Community Consultation Report (Annex E)*, SHWF identified the strategic approach they intended to undertake. Their approach recognises that consultation is a two-way process of informed communication between an organisation, the community and other stakeholders, on a particular issue prior to the organisation making a decision in relation to that issue. The four steps SHWF believe is common to any effective consultation strategy include the following:

- Step 1: Inform;
- Step 2: Engage;
- Step 3: Analyse; and
- Step 4: Recommend.

Using these four steps as a foundation, a consultation plan was developed and is being implemented in order to gain community support for the construction of the Stockyard Hill Wind Farm.

These steps are described in more detail below.

Step 1 - Inform

Prepare information for the consultation

Effective community consultation requires that all participants have a basic level of understanding about the proposed development, an understanding that has been formed from accurate information rather than common myths and speculation.

In addition to the information pamphlets and flyers already provided to the community, further material will be developed with a local focus to addresses specific concerns.

The websites (www.stockyardhillwindfarm.com.au or www.wind-power.com.au) provide a forum to convey key messages and updates on the project and will continue to be utilised in this manner through the lifetime of the project. SHWF acknowledges that this medium is not accessed by all stakeholders and therefore is not relied upon as a sole dissemination source.

Step 2 - Engage

Facilitation of Community Information Sessions

Several information sessions have been held to inform the community of various aspects of the project. These sessions allow various community members from all parts of Victoria to consult directly with SHWF representatives and consultants.

These sessions will continue to be used to inform the community at various project milestones. The emphasis will be on sharing information, listening to the opinions and concerns of the community, encouraging them to play an active role in shaping the future of the Stockyard Hill Wind Farm.

Initiate and convene a series of one-on-one meetings

One-on-one meetings have provided an opportunity for members of the community to discuss the wind farm with a SHWF representative in a confidential and nonthreatening environment. The result of these sessions were disseminated to the wider community (where relevant) to further inform stakeholders of any issues or concerns raised. These meetings were held at Beaufort and Skipton.

Regular Shire Council Updates

SHWF provides the Pyrenees Shire Council with regular project updates, in person, every two months. This is an opportunity to keep the Council informed and provide the community with a mechanism to provide feedback to SHWF via elected council representatives.

Community Reference Group (CRG)

SHWF initiated the establishment of a CRG which will be guided by a clear terms of reference, in order to impart a sense of ownership in the project; local residents have been encouraged to participate either by self-nominating or nominating another member of the community.

Members of the CRG will become the community's key points of contact for the project and will be responsible for supporting SHWF in providing accurate and timely information to the community and leading some local discussions.

Landowner Feedback Program

SHWF have undertaken an informal survey of all participating landowners. This was undertaken in response to a Shire Council meeting discussion. The results showed that all landowners were satisfied with SHWF's handling of the project (with the exception of one, which has been addressed). Landowners were also asked about possible recipients of the community fund. This information will be used to guide the relevant process associated with that aspect of the project.

Step 3 - Analyse

Develop a process of collecting and analysing feedback

A variety of simple feedback mechanisms have been and will continue to be developed to collect community views outside of the information forums. These may include, but are not limited to, the distribution and collection of feedback forms by CRG members and an online feedback form on the websites.

SHWF recently sought public input into the Brolga studies undertaken. Residents were invited to contribute observation details based on personal experience. Questionnaires were made available for completion subsequent to the informal Brolga BBQ, they were also posted on the website and forwarded to people who expressed an interest.

As stated above, SHWF contacted all landowners to invite feedback in relation to their level of satisfaction of SHWF's handling of the project.

Step 4 -Recommend

Detailed records kept to inform the planning of the wind farm

Detailed records are being maintained that document the history of community consultation and identify all stakeholder and community issues. These records detail the steps taken to engage the community, the actions taken to resolve their concerns and any future recommendations. The records have been used in the initial design phase of the wind farm.

2.2

CONSULTATION UNDERTAKEN

The Stakeholder and Community Consultation Report (Annex E) prepared by SHWF identifies the consultation activities which have been undertaken with the local community and other organisations including several public meetings, informal BBQ / meeting to discuss the Brolga study, numerous visits to neighbouring residencies, regular presentations to the Pyrenees Shire Council and ongoing liaison with DSE, DPCD, landowners and adjoining residents.

Table 2.1 below identifies some of the consultation activities already undertaken:

Table 2.1 Significant Consultation Events

Event	Date	Summary of the events and relationship
"Community Flyer #1" sent to various post offices throughout the area for distribution (Beaufort, Skipton, Ararat, Snake Valley)	March 2007	See <i>Annex E</i> for details.
Pyrenees Shire Council Meeting	July 2007	SHWF provide Pyrenees Shire Council with an update every two months at a Council meeting. Additionally, Corangamite Shire Council and Ararat Rural City Council were briefed on the project.
Information Day (Socom in attendance)	August 2007	The purpose of this information day was to introduce the proposal to the community. Approximately 60 people attended.
Newsletter No. 2 distributed to residents	November 2007	See <i>Annex E</i> for details.
Beaufort Agricultural Show.	November 2007	Wind Power stand and display showing wind farm layout and general information.
Community Barbecue with Brett Lane to discuss broilga study (Socom in attendance)	February 2008	This event was held specifically to inform the community about the targeted broilga investigation. Approximately 70 people attended the event at the Lake Goldsmith Hall.
Pyrenees Shire Council Meeting	March 2008	Regular two monthly meeting.
Meeting with members of Beaufort and Skipton Health Service Foundation Ltd about community fund	April 2008	
"One on One Meeting" in Skipton. 2 attendees	May 2008	One-on-one meetings provided an opportunity for members of the community to discuss the wind farm with a SHWF representative in a confidential and non-threatening environment.
"One on One Meeting" in Beaufort. 2 attendees	May 2008	As above.
Pyrenees Shire Council Meeting	May 2008	Regular two monthly meeting.
Newsletter No. 3 distributed, including broader area to cover all of Beaufort and Skipton	July 2008	
Pyrenees Shire Council Meeting	July 2008	Regular two monthly meeting.
Referral Information Day	July 2008	This information day provided an opportunity for SHWF to consult with the community about the details of the turbine positions and EES Referral. Approximately 80 people attended the event. Five SHWF staff were present in addition to Brett Lane (flora and fauna consultant) and a representative from ERM (landscape and planning consultant) to discuss any planning issues.

Meeting with Bendigo Bank about Community Fund	August 2008	
Pyrenees Shire Council Meeting	September 2008	Regular two monthly meeting.
A meeting was also held with the Western Plains Landscape Guardians, members of DPCD and Pyrenees Shire Council members	February 2009	This meeting provided an opportunity to discuss the planning process and general project consultation.
Meeting with Department of Planning and Community Development	April 2009	This meeting provided an opportunity to discuss the planning process and the requests for further information.
Meeting with DSE	April 2009	This meeting provided an opportunity to discuss the planning process and requests for further information.
Correspondence with Parks Victoria	February 2009	Contact was made to provide a general update on the project.
Briefing with VicRoads	February & March 2009	This meeting provided an opportunity to discuss, transportation issues and traffic management issues.
Meeting held with Bird Observers Club of Australia	April 2009	Meeting held to discuss project progress and additional information on avifauna utilisations of Lake Goldsmith.
Pyrenees Shire Council Meeting	May 2009	Regular two monthly meeting.
Liaison with Federal Member for Wannon David Hawker to provide a project update	May 2009	Letter distributed providing details of the proposed wind farm and associated facilities, as well as details of the planning and development process.
Liaison with Western Plains Landscape Guardians (WPLG)	May & June 2009	On-going liaison with WPLG to provide update on project details and address concerns raised.
Pyrenees Shire Council Meeting	July 2009	Regular two monthly meeting.
Meeting with Skipton Progress Association	September 2009	Meeting to provide a project briefing and to identify opportunities in Skipton.
Meeting with office of the State Member for Rippon, Joe Helper	September 2009	Meeting to provide project briefing.
Pyrenees Shire Council Meeting	September 2009	Regular two monthly meeting.
Liaison with DSE and DPCD regarding the progress of the planning application and EPBC referral	On-going	On-going liaison.
On-going liaison with landowners and surrounding residents	On-going	On-going liaison.

All public events were advertised with a minimum three weeks notice, based on feedback from the community.

2.2.1 *State Department Consultation*

In addition to the above, SHWF has had regular contact with representatives of the DSE and DPCD. The individuals SHWF have consulted include:

Department of Sustainability and Environment (DSE):

- Rod Davison;
- Richard Hill;
- Andrew Pritchard;
- Nicholas Wynn;
- Nick Jaschenko; and
- Garry Peterson.

Department of Planning and Community Development (Ballarat) (DPCD):

- Jason Taylor; and
- Shannon Meadows.

2.2.2 *Concerns Raised*

As identified within the *Stakeholder and Community Consultation Report (Annex E)*, throughout the community consultation programme several issues and concerns were raised by stakeholders including visual amenity, property devaluation, Broilgas, noise, community impacts, powerlines and landscape values.

2.3 *CONCLUSION*

The consultation process will continue throughout the life of the project, with appropriate strategies and techniques used at different times. For instance, it is envisaged that the community reference group will play a vital role in providing an interface for SHWF with the community, particularly during construction.

It is envisaged that the consultation strategy will continue to be refined and influenced by community feedback as the project progresses. This should improve acceptance levels of the wind farm, or at least reduce anxieties, by taking into consideration the views and suggestions of residents and stakeholders. This should minimise the impacts on residents and the environment during the construction, operation and decommissioning phases of the project.

For further details on the consultation process refer to *Annex E*.

3

SITE ANALYSIS

This Section identifies the existing conditions of the site and the surrounding area. It describes details of the location, site details, landuse, physical conditions (topography and geology), drainage and waterways, fauna and flora, landscape, heritage, infrastructure, transportation and access and the wind resource.

3.1

LOCATION

The site proposed for the Stockyard Hill Wind Farm is located approximately 150 km west, north-west of Melbourne and approximately 35 km west of Ballarat (refer to *Figure 1.1*).

The site is located between the townships of Beaufort (approximately 4.5 km north of the site) and Skipton (approximately 4.0 km south of the site). Other nearby towns and communities are detailed within *Table 3.1* below.

Table 3.1 *Proximity to nearby townships*

Townships	Distance (km)
Skipton	4.0
Beaufort	4.5
Trawalla	6.0
Pittong	4.8
Linton	12.0
Snake Valley	12.2
Carngham	13.1
Ararat	30
Ballarat	35

The township distance is measured from the town centre to the nearest wind turbine.

3.2

SITE DETAILS

The site comprises approximately 15,617 hectares and is generally bounded by Stockyard Hill Road, Long Gully Road, Dalgleishs Road and Caramuir Road to the north and east, Eurambeen-Streatham Road and Beaufort-Carranballac Road to the west and the Glenelg Highway to the south. Skipton and Stockyard Hill Roads bisect the subject site (refer to *Figure 3.1*).

The site is used predominantly as freehold agricultural land (discussed further at *Section 3.4 and 16*). SHWF has entered into commercial agreements with 55 landholders to host the wind farm. The Certificate of Titles relevant to this project are summarised within *Annex F – Land Title Details* and full details are included in *Folder IV*.

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Figure 3.1 Existing Conditions Plan

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There are a number of encumbrances on the land titles including caveats, easements and Crown Grants. These encumbrances relate to carriageways and powerlines, as well as Crown Grants for mining and petroleum extraction. These encumbrances do not affect the proposed use or development of the wind farm.

No wind turbines are proposed within the road reserves, however throughout the main wind farm site there will be a need to construct powerlines, lay underground cables and create new access points to the local road network across some road reserves. The proposed underground cabling and required access points avoids, where possible, any areas of significant vegetation. This is discussed further in *Section 4*.

3.3

CURRENT LANDUSE

The primary use of the site is agriculture with the majority cultivated for grazing and cropping. The site has a long history of agricultural use and accordingly is highly modified with little remnant vegetation remaining on the site.

Table 3.2 identifies that there are 55 participatory houses forming part of the proposed Stockyard Hill Wind Farm project (refer to *Figure 3.1*). Participatory houses are houses located on sites which, in full or in part, form part of the wind farm site. 25 of the participatory houses are located within the site boundary. A further 32 houses (participatory and non- participatory) are located within 1.5 km radius of the site. A total of 129 houses (participatory and non- participatory) are located within 3 km of the site as shown in *Table 3.2* and in *Figure 3.1*.

Table 3.2 *Number of Houses*

Dwelling Locations	Total number of participatory houses	Total number of non-participatory houses
On site (within site boundaries)	25	0
Within 1.5km (off site)	17	15
1.5km to 3km (off site)	14	58
Total	55	73

Note: The above table has been calculated by measuring the distance from the proposed turbines to the surrounding houses.

There are several State parks within proximity to the site; namely Langi Ghiran State Park located approximately 20 km north-west of the nearest wind farm site boundary and Mount Buangor State Park located approximately 8 km north west of the nearest wind farm site boundary.

Existing wind farms closest to the site's boundary are located at Challicum Hills, approximately 25 km north-west and Waubra Wind Farm, located approximately 32 km north-east. The approved Lexton Wind Farm is located approximately 29 km to the north of the site. It should be noted that the above measurements have been calculated from the outer edge of the proposed Stockyard Hill Wind Farm site to the centre of these wind farms. The identified distances were not calculated using GPS coordinates and are hence only an approximation of distance. In addition, should the distances be measured from the nearest Stockyard Hill Wind Farm turbine to the nearest neighbouring wind farm turbine, the distances would be less.

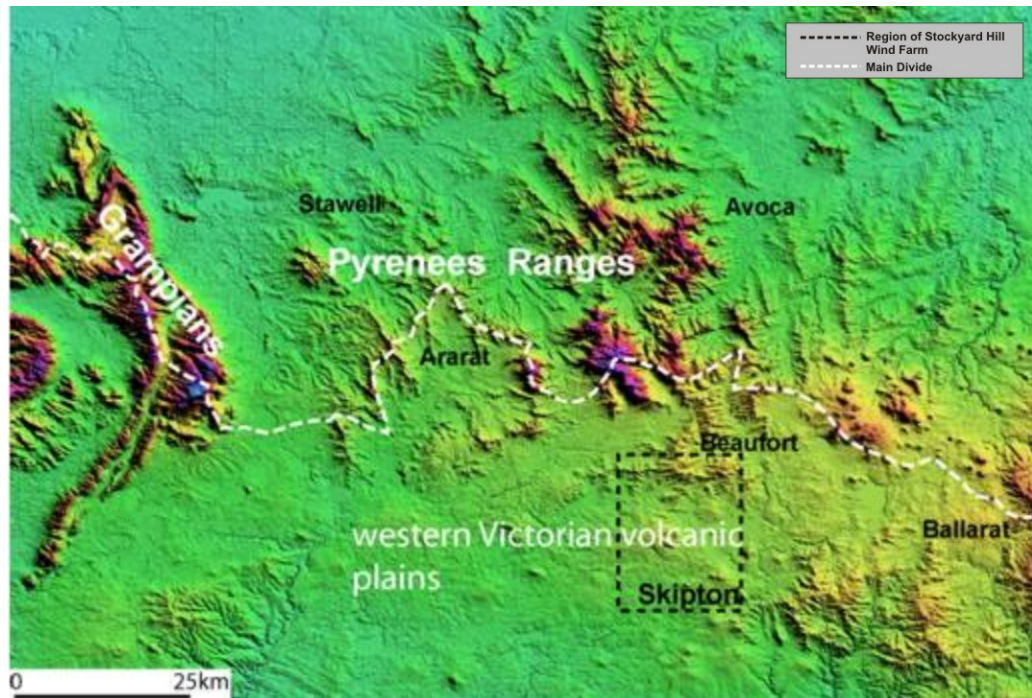
For further details of the land uses of the site refer to *Section 16* of this report.

3.4

PHYSICAL CONDITIONS

The site and surrounding landscape generally comprises of flat farmland, however the landscape is punctuated by Monmot Hill, a volcanic cone and Mount Emu a granite hill.

The proposed wind farm site is located south of The Main (drainage) Divide in western Victoria. It occurs across part of two major landform regions, the southern flanks of the Western Uplands (the Pyrenees Range) and the northern section of the Western Plains as identified within *Figure 3.2*. These areas include landscapes developed initially on Palaeozoic sedimentary and granite rocks and subsequently covered by extensive flows of basalt lava.

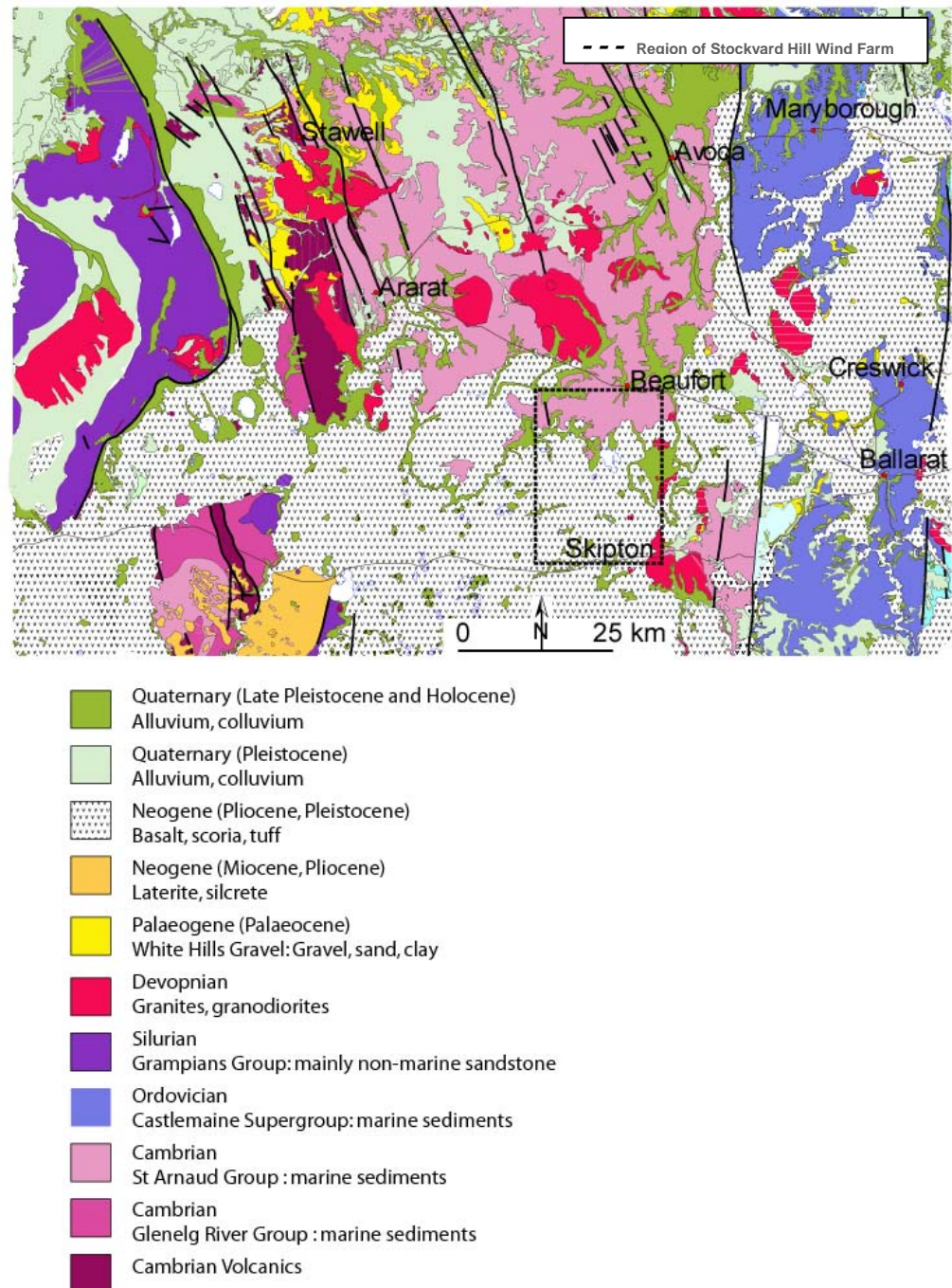


Source: *Stockyard Hill Wind Farm - Geology, Geomorphology and Geoscience Values*, (Environmental GeoSurveys Pty Ltd, September 2008).

Figure 3.2 *Topographical Context*

The local geology of the site and the surrounding area is quaternary basalt derived from ancient eruption points, such as Stockyard Hill, which is an extinct volcano and its crater currently holds Black Lake which is an ephemeral semi-saline water body (dry). Low stony rises, including surface and embedded rock are also common across the site, especially in unimproved and uncultivated areas of pasture. Some of these areas support remnant native grassland.

The geological basement of western Victoria is a thick sequence of Lower Palaeozoic (Cambrian to Silurian) predominantly marine sedimentary rocks intruded by extensive bodies of Devonian granite as identified in *Figure 3.3* below.



Source: Stockyard Hill Wind Farm - Geology, Geomorphology and Geoscience Values, (Environmental GeoSurveys Pty Ltd, September 2008).

Figure 3.3 Geology of part of western Victoria surrounding Stockyard Hill Wind Farm site

The subsurface profile of the site is expected to comprise surface residual silts and sands, underlain by moderate to highly reactive clay soils which grade to variably weathered rock with depth. The depth of bedrock may be variable with shallower depths anticipated for newer Volcanic and Devonian geological types and deeper for the Ordovician geology types.

For further details of the topography and geology of site refer to *Section 8* of this report.

3.5

DRAINAGE AND WATERWAYS

The site contains a number of minor watercourses (including two minor and several ephemeral water courses), brackish lakes, smaller swamps, and wetlands (refer to *Figure 3.1*).

The majority of the lakes and water bodies are brackish or saline. The land formation of the area features natural depressions that facilitate capturing surface water, resulting in most of the streams being ephemeral. However, many of the soils within the site are highly porous tending to minimise surface water capture. According to information provided by DSE, the site is not located within a designated water supply protection area.

There are two lakes within the study area, Lake Goldsmith and Black Lake along with the smaller lake and wetlands of Slater Lake, Buln Gherin Swamp and farm dams (Refer to *Figure 3.1*).

Two minor designated creeks and several small ephemeral creeks exist within the study area. The two minor creeks are Mount Emu Creek to the east and Fiery Creek to the west.

In addition to the two designated waterways, many smaller creeks are present. These creeks appear to be largely ephemeral, and are likely to flow for a short time following a rainfall event feeding water to both the lakes and localised depressions or to Fiery or Mount Emu Creek.

There are 357 bores within a 20km radius of the proposed wind farm site. Of these, 27 were licensed for investigation and observational uses, 109 were for domestic and agricultural use, 139 were not groundwater bores, 1 was for drought relief and 81 did not have a use listed.

Hydrological maps of the site suggest that groundwater flows at the southern area of the site are towards the south, and the northern area of the site flows towards the north.

For further details of the drainage characteristics and the waterways of site refer to *Section 8* of this report.

3.6

FLORA AND FAUNA

Flora

The southern area of the site is mostly cleared of native vegetation and the main land use is agricultural. Some native vegetation remains, associated with wetlands or with remnant native grasslands. Some of these areas are considered high quality fauna habitat.

The north of the study area contains remnant patches of heathy dry forest amongst cleared grazing land. In this part of the site, there is less agricultural development because of the poor nature of the sandy soils, and therefore some pastures still contain remnant native vegetation.

A total of 124 plant species (87 (70%) indigenous and 37 (30%) introduced (including non-indigenous native)) have been recorded on site. One threatened flora species, the Golden Cowslips (*Diuris behrii*) (listed as vulnerable within Victoria) was detected in the northern part of the wind farm site.

Seven EVCs have been identified within the study area, namely Heathy Dry Forest (EVC 20), Plains Grassy Woodland (EVC 55), Stony Rises Woodland (EVC 203), Plains Grassy Wetland (EVC 125), Grassy Woodland/Heathy Dry Forest Complex (EVC 896), Grassy Woodland (EVC 175_61) and Heavier-soils Plains Grassland (EVC 132_61). A total of 21 remnant vegetation patches and eight scattered trees have also been identified within the development site.

Fauna

Fauna recorded on site were mainly native, made up of common farmland and bushland birds. 62 bird species were recorded during the assessment, with common farmland birds the most common species recorded. Small numbers of birds of prey (including Wedge-tailed Eagle) and waterbirds were observed on the site.

Four mammal species, four reptile species and nine bat species were recorded during the assessment. No amphibians were observed on the site. The nationally Vulnerable Striped Legless Lizard (*Delma impar*) (including one potentially gravid female which would represent a breeding population) and state listed Fat-tailed Dunnart (*Sminthopsis crassicaudata*) were recorded within the site.

Brolga

The Brolga is well known from the Streatham–Skipton area and breeds in smaller, seasonal and permanent wetlands throughout this area. Within 20 km of the boundary of the proposed wind farm, there are at least five historically known Brolga flocking sites (Atlas of Victorian Wildlife records). Up to six breeding sites are estimated to occur within 3 km of the wind farm boundary.

For further details of the ecological features of the site refer to *Section 9* of this report.

3.7

LANDSCAPE

The areas surrounding the Stockyard Hill Wind Farm are predominantly cleared, and compromise existing infrastructure including roads, rail, transmission lines, towers, power lines, communication towers and fences.

Landscape units of the Stockyard Hill Wind Farm site can be defined in relation to the topography, geology, vegetation and the landuse. The landscape units for the site and the sounding area are defined below.

- Flat Farmland

This landscape unit is the most common within the site and surrounding area. These areas are generally cleared with only occasional remnant or planted tree lines present. There are also many instances of constructed elements within this landscape type including road and rail network, farm buildings and fences.

- Hilly Farmland

This landscape unit describes those cleared hills used for agricultural practices. This unit has often been selected as the site of proposed wind turbines.

- Forested Hills

In this landscape unit 'Forested Hills' occur primarily in State Forests, State Parks, Regional Parks and local reserves. These include Langi Ghiran State Park, Mount Buangor State Park and the Trawalla State Forest.

- Rural Townships

The rural township of Beaufort lies approximately 4.5 km north from the nearest site boundary of the proposed wind turbine. The township of Skipton lies approximately 4.0 km south of the nearest site boundary. There are several other smaller localities within the surrounding area including the following:

- Beaufort to the north;
- Trawalla to the north-east;
- Skipton to the south;
- Buangor to the north-west;
- Pittong to the south-east;
- Snake Valley to the west;
- Carngham to the west; and
- Linton to the south-east.

For further details of the landscape and visual features of the site refer to *Section 18* of this report.

3.8

HERITAGE

The site has not previously been surveyed for any cultural heritage purposes and very few heritage surveys have been completed in the region.

There are two previously recorded Aboriginal sites within the activity area. One of these is an earth mound located near Nerring (AAV7523-0027), and the other a post-Contact site: the Stockyard Hill Honorary Correspondent Depot (Historic Place Report 5.4-67). This site is identified on the Pyrenees Shire Planning Scheme Heritage Overlay as the Old Homestead at Mawallok (HO32).

There are four non Aboriginal historic structures previously recorded within the activity area. These include the Stockyard Hotel ruins (H7522-0001), a Boundary Riders Hut (HO33), the Old Homestead at Mawallok (HO32) (also of Aboriginal heritage significance as discussed above) and the remnants of the Lake Goldsmith School (HO37).

On the 27th November 2008 the Heritage Council of Victoria determined, in accordance with the Heritage Act 1995, that Mawallok is of cultural heritage significance and should be included on the Victorian Heritage Register. The property was added to the register in late 2008.

For further details of the Aboriginal and non- Aboriginal cultural heritage features of the site, as well as Mawallok refer to *Section 10* of this report.

3.9

INFRASTRUCTURE

Infrastructure on site is predominantly agricultural in nature and includes sheds, dams, access tracks and fencing. The site also contains water mains, electricity cables and telephone cables. Septic tanks are located at each dwelling. The surrounding area contains the agricultural infrastructure similar to that of the site.

Three anemometers (monitoring masts) are currently located on the site (refer to *Figure 4.1*). The existing masts were installed during February, August and December of 2008. Two of the installed masts have a height of 62 m and one has a height of 80 m.

For further details of the proposed infrastructure refer to *Section 4* of this report.

3.10

TRANSPORTATION AND ACCESS

The site is intersected by one local connector road, Skipton Road, and is bounded or bisected by several minor roads including:

- Beaufort - Carranballac Road;
- Carngham - Lake Goldsmith Road;
- Eurambeen - Streatham Road;
- Geelong Road;
- Mt William Road;
- Stockyard Hill Road;
- Stockyard Hill - Wangatta Road;
- Streatham - Carngham Road; and
- Streatham - Mortchup - Mt Emu Road.

The surrounding transport infrastructure includes the Western Highway to the north and the Glenelg Highway to the south which are categorised as "Highways", and are the responsibility of VicRoads.

For further detail of the transport and traffic characteristics of the site refer to *Section 11* of this report.

3.11**WIND RESOURCE**

The Victorian Wind Atlas 2003 identifies that the Stockyard Hill Wind Farm is located within an area that receives an average wind speed of between 7 and 7.5 m/s-1 at a height of 65 metres, as shown in *Figure 3.4*.

The Stockyard Hill Wind Farm will use higher towers than were used by Sustainable Energy Authority Victoria (SEAV) in the development of the State Wind Atlas. This increase in height will result in an increase in the average wind speed as there will be a reduction in turbulence due to surface roughness resulting in a significantly improved energy yield.

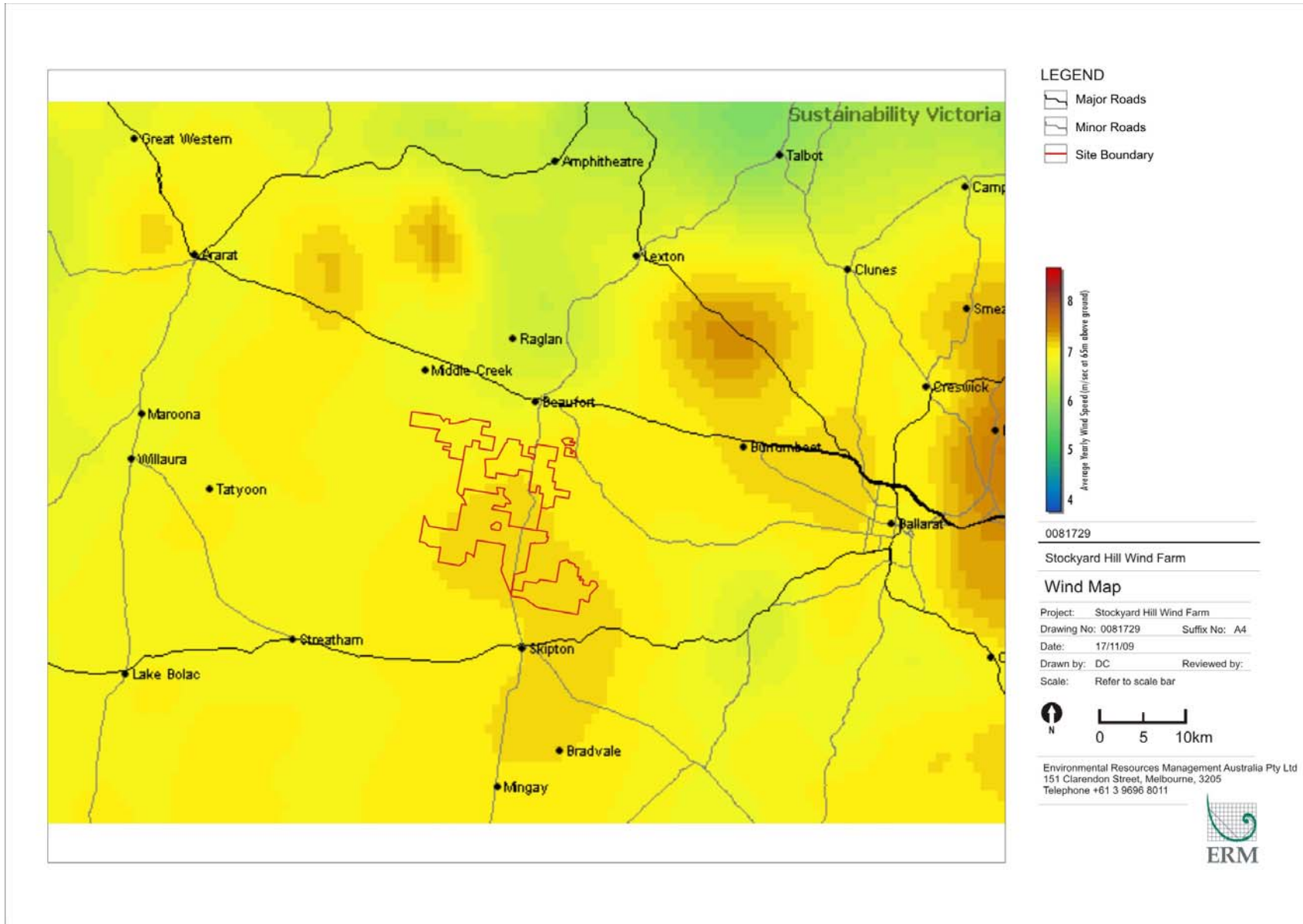


Figure 3.4 Victorian Wind Atlas

The existing conditions of the site influenced the turbine layout and overall design of the proposed wind energy facility. These findings and how they affected the proposed site design is further discussed throughout this report and more specifically in *Section 5- Design Response*.