Synergy Wind
St Clair Wind Farm
Energy Development

November 2010

Draft Development Application to the Shire of Bass Coast

Synergy Wind Pty Ltd: Wind Farm Developments
Synergy Wind Pty Ltd

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Wind as a Renewable Energy Source

Wind energy is an indirect form of solar energy. Between 1 and 2 percent of the solar radiation which reaches the Earth is converted into wind energy. Broad-scale winds result from a range of factors, including the earth's rotation, the distribution of continents and oceans, uneven heating of different areas of land and water surfaces, varying rates of evaporation and condensation of water, and the development of (high and low pressure) synoptic systems.

Seasonal variations in the speed and direction of synoptic wind result from changes in the relative inclination of the earth towards the sun, which in turn changes the patterns of differential heating. Other variations are caused by changing sea surface temperatures, which are affected by large-scale ocean currents and up welling of colder bottom waters. Geography and topography can have a strong modifying influence on regional wind patterns. Examples include the tendency of coastlines to generate (onshore) sea breezes during the day and (off-shore) land breezes at night, with cold air drainage (katabatic) flows often occur at night in valleys. The wind is never constant, with fairly rapid changes in wind speed and direction being most typical. Wind near the surface also tends to decrease with decreasing height, as a result of drag caused by contact by contact with the surface (an effect known as "wind shear"). Wind shear is more pronounced over land than water because of the increased surface roughness (including the presence of terrain, vegetation and buildings).

Wind energy in Victoria

Victoria is commonly regarded as one of the best, if not the greatest, states to develop wind energy in Australia. This is due to its position amongst the Roaring Forties and high wind yields in select parts, including the northeast of the state. Currently the installed capacity for wind energy (estimated as at May 2010) is 427.7MW. This includes large projects such as Waubra (192MW) and 132MW combined from the Yambuk, Cape Bridgewater and Cape Nelson 4-stage Portland project. In contrast to other states in Australia, South Australia is currently by far the nation's leader in wind

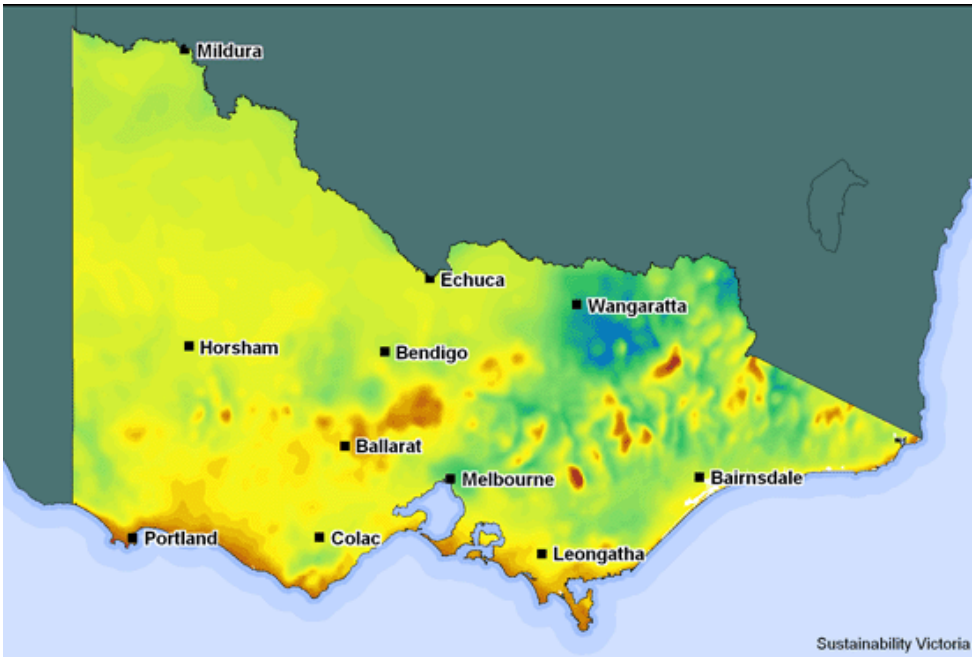
energy, with 810MW installed, with Western Australia and New South Wales behind Victoria (at 202MW and 172.6MW respectively). [1]

Variability in Electricity Production

Electricity production at wind farms depends on the wind speed at any particular time. Therefore, the electricity output can vary from zero to full production; however, electricity users generally require either continuous supply or for the supply to match the varying demand. Generally, the wind turbine output and the end user's demand will seldom match.

These supply/demand imbalances will be overcome by connecting the wind farm electricity output into the electrical grid at the regional substation on the east side of Wonthaggi. This will give SP AusNet flexibility to meet the demand from a number of electrical energy sources. The grid connection of the proposed wind farm will be realised and paid for by Synergy Wind Pty Ltd. All installations outside the proposed wind farm will become property of SP AusNet after completing the connection. These improvements and upgrades to the grid infrastructure will be of benefit to the whole region.

Figure 1 Victoria's Wind Energy Atlas (average yearly wind speed)

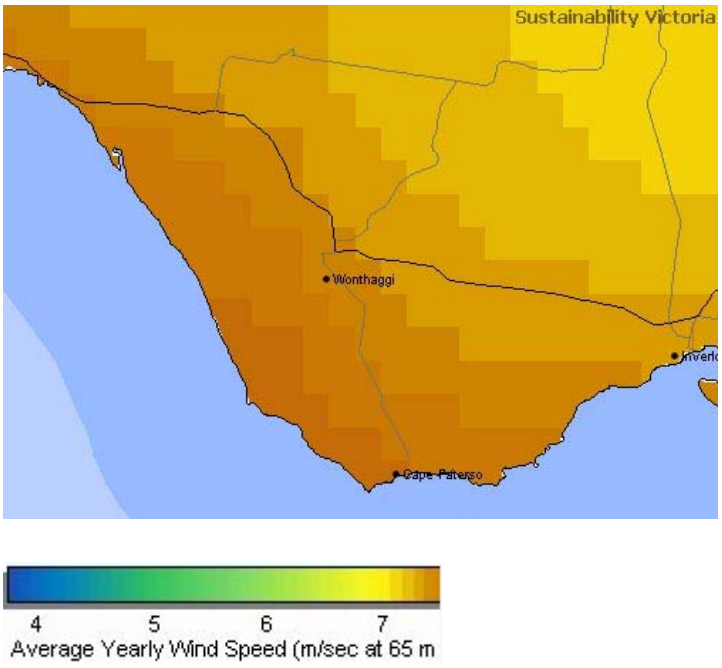


Source: Sustainability Victoria 2002.

[1] Note – these figures are based upon research finalised on 30th October, 2009.

Key: Average Yearly Wind Speed (metres per second at 65 metres above ground

Figure 2 Wind speed at Wonthaggi, Victoria



Source: Sustainability Victoria 2002

Site Selection

Within Australia, suitable wind farm sites are limited to specific areas where wind speeds are consistently high. As can be seen in figure 1 below, from the Victorian Wind Energy Atlas released by the CSIRO in 2002, these areas include northwest Tasmania, the Bass Strait Islands, the southwest tip of Western Australia, the Portland, Cape Otway, South Gippsland areas in Victoria, the west coast of Western Australia near Broome, and some inland pockets in southern New South Wales and northeast Victoria.

Furthermore, electricity demand in the area will increase due to the Wonthaggi desalination project which is currently under construction with completion expected by late 2011. The close proximity of the St Clair Wind Farm project allows the opportunity for the plant to be powered by this project. The development is planned for up to 30MW.

Limitations occur as many high wind energy sites are unavailable because of land constraints associated with proximity to urban areas, land tenure, land of scenic beauty or environmental

constraints. Others are unlikely to be developed due to physical impediments such as poor vehicle access or unavailability of local electrical distribution points.

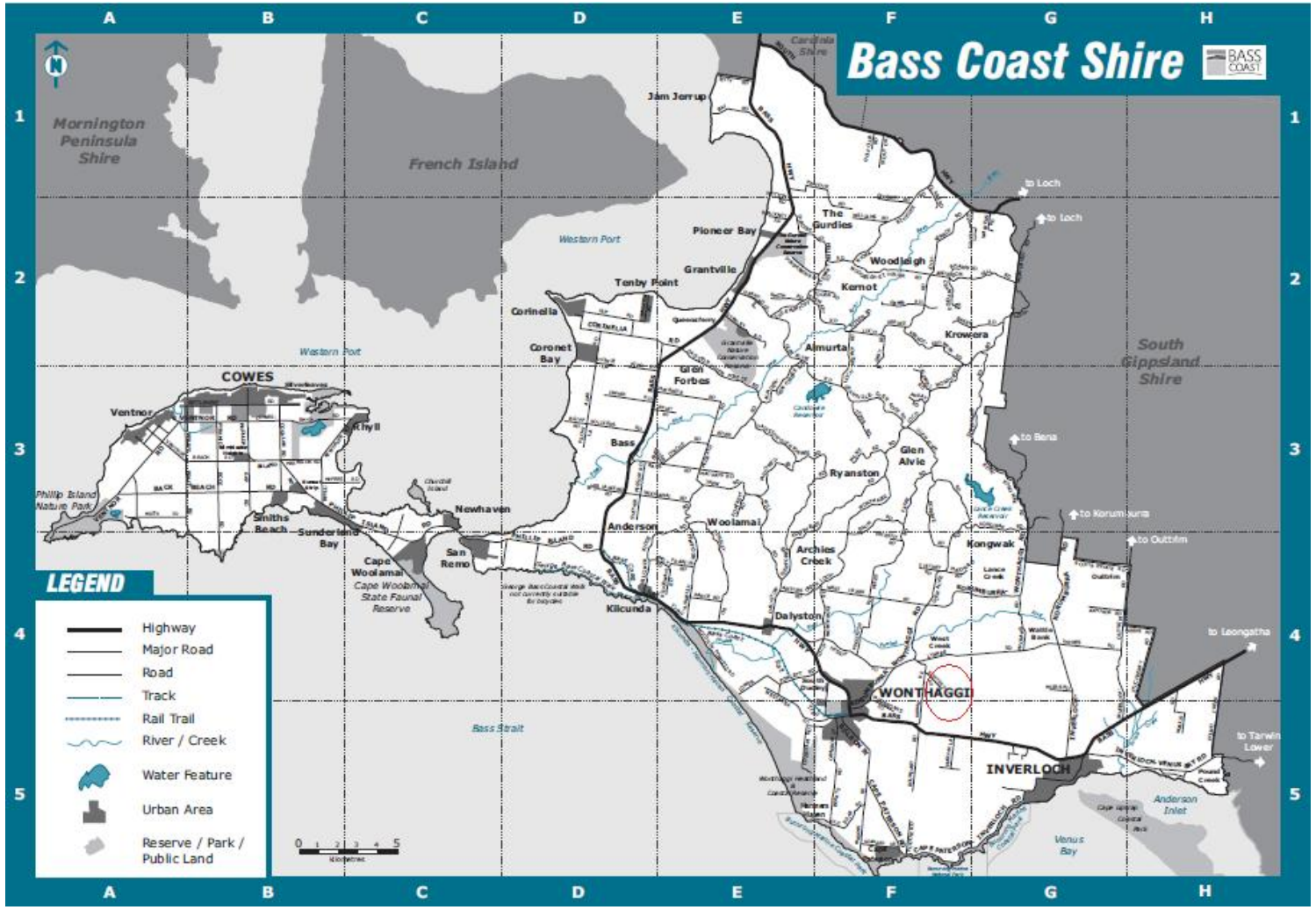
The following environment and amenity selection assessment criteria have been considered in this assessment. The following table sets out under the heading 'General Criteria' Synergy Wind's policies in assessing a possible wind park site.

Site description

The St Clair wind farm is located approximately 12 kilometres inland upon primarily cattle grazing and farming properties and several associated residences within the Shire of Bass Coast, in the south-eastern coast of Victoria. The site contains excellent wind yields due to its proximity to the strong south coastal wind resource, with an average wind speed approximately 8m/second (seen in figures 1 and 2 above). It lies 5 kilometres east of the existing Wonthaggi wind farm. It also presents the opportunity to power the nearby Victorian Wonthaggi Desalination Project currently underway, due to be completed in 2011. It will cement this region of Victoria as a key area for promoting wind energy, with other operational projects including Wonthaggi and Toora already existing. Currently, the site in question is used for primarily agricultural farming (dairy farming) purposes. A number of residences (the owners who operate these farming businesses) live on the site, as futher observed in figures below.

St Clair lies within the greater Wonthaggi regional area, with neighbouring townships including Kilcunda, Powlett River, Wattle Bank and North Wonthaggi, as observed in figures 3 and 4 below.

Figure 3 St Clair wind farm within the Shire of Bass Coast



Source: Bass Coast Shire Council 2009 (circle inserted).

Figure 4: St Clair wind farm, regional context of Wonthaggi

Source: Department of Planning and Community Development 2009, 'Planning Maps Online'.

Table 1: Evaluation of the St Clair wind farm

	Subject	St Clair wind park site
1.	**Wind Resource** *Sites for which initial investigation indicated an average wind velocity less than 7 m/s not considered.*	*The Victorian Wind Energy Atlas indicates wind speeds between 7m/s and 8 m/s at 65 m above ground, which is suitable for wind farm development. Wind measurements have been conducted from May 1998 to March 2004 on 63m & 40m by CSIRO.*
2.	**Planning Controls** *Sites not appropriately zoned or in zones set aside for future intensive growth were not considered. Similarly, sites covered by overlays of high scenic landscape or environmental significance not considered.*	*Site zoned for Farming and current farming land use will not be affected by wind farm use (it has been consistently observed around the world, and in Victoria, that wind farms are able to continue the facilitation of prior farming practices upon sites with installed turbines).*
3.	**Government Policy** *Sites supported by Planning Policy, Economic Development and Greenhouse reduction strategies considered.*	*Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria and the Shire of Bass Coast Council Planning Scheme provide no immediate impediments. Wind Farm capital investment and on-going operations provide substantial economic activity.*
4.	**Site Ownership** *Public land was not considered, nor land where owners not supportive of wind power.*	*Site in private ownership with landowner supporting wind farm development with suitable agreements in place.*
5.	**Site Use** *Land in rural use, cleared and under pasture or cropping considered.*	*Site is used for farming, cleared land, relatively flat (refer to figure 6).*
6.	**Adjoining Land ownership** *Sites adjacent to significant State or National Reserves of visual, scientific or*	*No significant State or National Reserves except for proximity to Powlett River, as recognised by the*

	cultural significance given low priority	*Environmental Significance Overlay (discussed later on).*
7.	**Adjoining Land Use** *Sites adjoining or in close proximity to Residential or other sensitive land uses not considered.*	*Adjoining uses are rural. Few houses adjoining the wind farm site.*
8.	**Site Area and Turbine location** *Sites of adequate area to provide a proper layout of towers, generally 250 to 350m apart and 400 to 500m between any grid rows were considered.*	*Site provides an excellent area to position 10-15 wind turbines for efficient operation. Turbine layout was also chosen so that the amenity of neighbours will not be unreasonably affected (note, this can be altered to further minimise impact).*
9.	**Electrical Grid Connection** *Sites remote from electricity grid or in areas with unsuitable electrical infrastructure not considered.*	*An existing 66 kV line from the Wonthaggi regional substation crosses the wind farm area and can be used to connect the wind farm directly to the grid.* *Alternatively, approximately 5 km of new line required from wind farm site to the existing Wonthaggi regional substation at Korumburra Rd, North Wonthaggi, would need to be constructed.*
10.	**Flora and Fauna** *Sites supporting Flora and Fauna of State, National or International significance not considered where significant impact could occur.*	*An Expert flora and fauna assessment will provide an overview of site analysis and response. A preliminary assessment shows that no significant environmental, flora and fauna issues are identified.*
11.	**Noise** *Sites where potential turbine locations within 500 m of existing dwelling or where noise levels contours exceed Australian New Zealand standard AS/NZ 6808 not considered.*	*Only the two stakeholder dwellings are within 850 m of a turbine. No third party dwelling lies closer than 1.1 km from any turbine. No dwellings within the strict noise contours of the Australian New Zealand standard AS/NZ 6808.*
12.	**Blade Glint** *Sites where blades in full view and less*	*The towers and rotors will be finished with non- reflective*

	than 500 m to existing dwellings given a low priority.	*coatings using colours recommended by the visual consultant to minimise visibility and totally eliminate "blade glint" effects.*
13.	**Shadow Flicker** *Sites on north side (from north east to south west) of existing dwellings within 500m given a low priority.*	*Shadow flicker assessments will be finalised on the fifteen turbine layout. In the case that a house would be affected by shadow flicker, the offending turbine would be programmed to shut down for the duration that this problem would otherwise occur. This is a standard feature of all modern turbine control software.*
14.	**Electromagnetic interference** *Sites within 500 m of existing housing and sites in the direct line of existing micro wave transmission given a low priority.*	*No direct microwave transmission line of sight installations. No dwellings within 1000 m.*
15.	**Visual Impact** *Sites with significant exposure (visually) to reasonable close urban areas, to main arterial roads or other areas frequented on a regular basis by the community and or tourists to existing attractions given a low priority.* *Sites within a significant visually impressive landscape or which would be viewed at close to medium range from popular public scenic viewing areas given a low priority.*	*Site is not within a significant viewing area and not within any direct views to any features of visual significance.*
16.	**Archaeological Significance** *Sites with a high scientific or cultural significance not considered*	*No archaeologically significant areas identified on site.*
17.	**Vehicle Access** *Sites with inadequate or poor vehicle*	*Adequate vehicle access to site. Site soil conditions*

	access, or where in any upgrading (for construction and general traffic) would be environmentally unsound or economically prohibitive were rejected.	*adequate for sub pavement foundations for construction and general traffic both in term of frequency and wheel loads.*
18.	**Weather / Climate** *Sites within known adverse weather areas which could affect access, or cause high operating costs were given a low priority.*	*Analysis of local weather and wind monitoring show that local conditions are suitable for a wind farm. Turbines are designed for a survival wind speed of approximately 210 km/h. No wind on record of this magnitude in the region.*
19.	**Aviation** *Site in proximity to local airfields not considered*	*There are no airfields within the immediate area of this development.*
20.	**Site Discharge** *Sites in highly sensitive environments for site discharges not considered*	*No proposed site discharges.*

Wind farm design

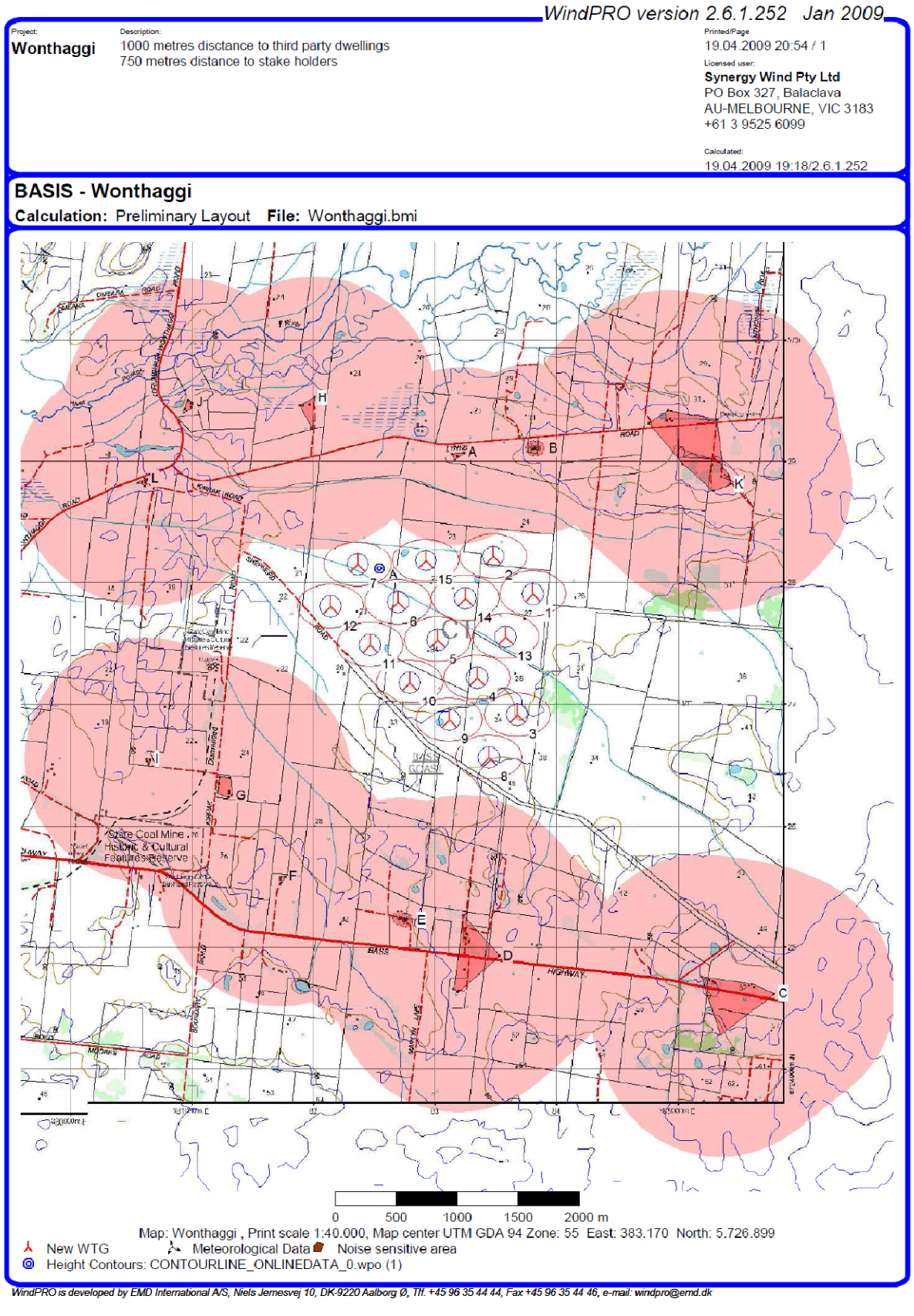
Wind farm design is a dynamic process and many factors must be considered in their design. Firstly consideration must be given to the wind resource and then technical, environmental and social factors must be taken into account. Furthermore, the benefit that the project provides to the local region and the entire state of Victoria in terms of sustainable energy provided and the abatement of fossil fuel based energy production this will enable must be considered as a primary component of the wind farm.

Maximising the wind resource

Wind speed at different locations on a particular site is influenced by many factors, including elevation, topography and the "roughness" of the land surface (including vegetation and buildings). Generally, wind speeds will be higher at locations which are most elevated and surrounded by smooth landforms which are largely clear of shrubs and trees. The Toora Wind Farm, located within the neighbouring Shire of South Gippsland, is an example of such a development. Because of the cube relationship between wind speed and the amount of energy which can be extracted from it, a wind turbine located where the wind speed is approximately 8m/s will produce the same amount of energy as two identical wind turbines exposed to a 6 m/s wind speed. Therefore, siting wind generators on the windiest areas of the site will have a significant effect on the power output, greenhouse gas abatement and the overall economic result of the project. The wind turbines also need to be separated by a sufficient distance to minimise the effect on wind speed of turbulent wakes from upwind turbines and the aerodynamic efficiency of the down-wind turbines blades. On-site wind monitoring data was used, together with factors including elevation, landform, surface roughness and spacing between wind turbines, in determining the "first-cut" layout of the wind farm.

As seen below, currently 15 turbines are planned for the subject area in question. No dwellings are within immediate proximity to turbines. Furthermore, the turbines will be located roughly 500 metres apart to ensure safe operation and maximum efficiency of the turbines.

Figure 5 St Clair wind farm turbine location and distance of nearby dwellings



Technical factors

A number of technical factors have a direct bearing on the design and construction of the project and its economics. These include:

- Geotechnical conditions of the site and associated foundation requirements.
- Landform stability for excavation and maintenance of cable trenches, tracks and foundations.
- Topographic features which influence the positioning of access tracks.
- Access from local roads.

Environmental factors

Environmental economic and social factors can have a strong influence on the size, design and micro-siting of wind turbines and associated facilities. The extent to which the design and layout of wind farms responds to relevant environmental and social factors can have a major bearing on community attitudes to such projects. The design must:

- Consider existing landscape values.
- Minimise effects on native flora.
- Minimise effects on native fauna.
- Avoid cultural heritage sites.
- Avoid unacceptable noise, flicker and glint impacts on local residences.
- Consider impacts on local tourism, employment and recreation.

Furthermore, the ESO and LSIO will cater for these environmental factors, and the environmental management plan required by clause 52.32 (or if over 30MW the Policy Guidelines).

Design response

The locations of the wind turbines on the land currently in question are shown above in figure 5. The turbines will be located approximately 500 metres apart, on clear farming land. This is to allow the safe rotation of the blade radiuses, and to promote more favourable siting for nearby residents.

The arrangement of the turbines is consistent with good wind farm practice guidelines. It does not require the removal of any significant native vegetation or the disturbance of cultural heritage sites, enables earthworks to avoid the low-lying swales and the sewer easements, has a minimal impact on landscape values, and provides a separation distance of about 850 metres to the nearest dwelling.

The colour and surface finish of the wind turbines will be based on the advice of the landscape and

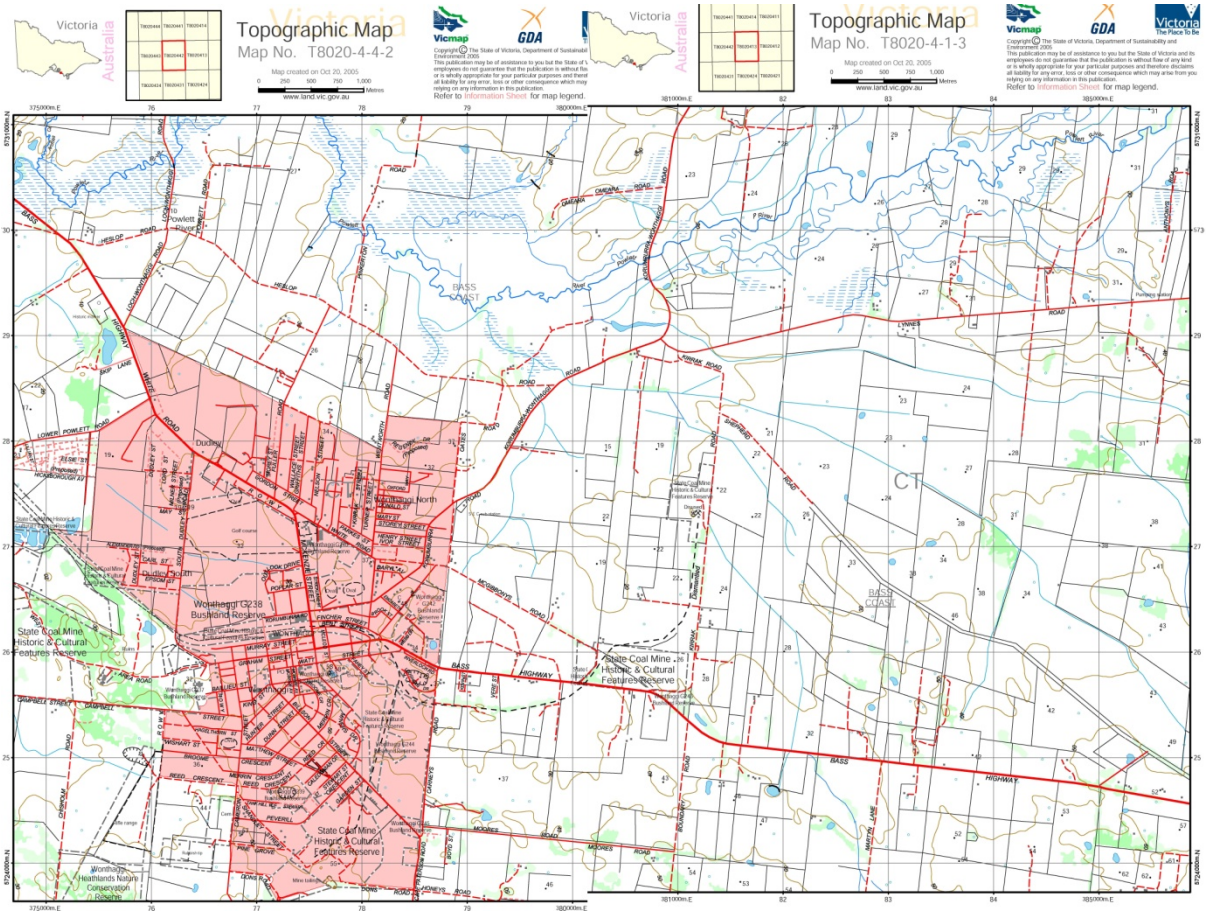
visual consultant to minimise their visual impact.

Dimensions and topography

As identified in figure 5 above and figure 7 below, the wind farm will be located upon a site of cleared, agricultural land. Vehicle access is available via Shepherd Road and the linking Duttrim and Lynnes Roads.

Figure 6 Aerial montage of the St Clair wind farm

Figure 7 Topography at St Clair wind farm



Existing land use

The existing land use of this area is for agricultural production (primarily dairy) and residential dwellings. These will not be disrupted by the development of a wind farm upon this site. Farming is able to continue after the construction of the turbines is completed, and turbines will be placed within a distance from houses as agreed with individual landowners.

Consideration of future land uses

Future land uses will not be significantly affected by the installation of turbines upon this land. Turbines generally have a life span of roughly 20 years (and as such so do the acquired land leases) and once this stage has passed, a wind turbine facility may be again developed for wind energy, or for other uses (such as housing, other renewable energy forms, farming). The turbines will not significantly affect these future uses. For example, the major construction work that will occur will include building beneath the earth to cement the turbines in the ground and the creation of roads and power infrastructure – uses which are easily reversible.

Cultural features

The land in question does not contain immediate significant cultural features as noted in other areas of this region (such as Sillocks Hill regarding the nearby Toora wind farm) within the immediate region of the wind farm; rather, the cultural impact of the development will be apparent from a greater distance. This could potentially be an issue due to much of the greater regional area (such as Wonthaggi) containing many residences purchased for part-time use (i.e. a 'holiday house') and the importance of the region for tourism (i.e. on the way to Phillip Island or Wilsons Promontory). Wind farms have often been uneasily accepted in tourist areas (such as the Great Ocean Road), and the decision to install turbines in this location may incur resistance due to these cultural features.

Proposed On-Site facilities

Wind turbines

The on-site facility will consist of 10 or 15 wind turbines (depending on turbine type and size), their supporting foundations beneath the land surface, 10 to 15 transformer kiosks and access tracks for routine operation and maintenance.

Each of the wind turbines will comprise a 3-bladed rotor driving a horizontal-axis generator and gearbox assembly which are mounted atop a steel tower. The overall height of each wind turbine will be approximately 120m to 130m. These turbines are larger than various structures within existing wind energy facilities around Victoria, such as the Toora wind farm which has turbines with a height of 67 metres and a rotor total diameter of 66 metres. Larger turbines can be used to take advantage of the wind yields, which at 8 m/s are very strong in this site, and the lack of landscaping features such as hills, unlike at Toora.

Figure 8 illustrates a typical wind turbine which will be utilised in this project.

- The tubular steel towers will be about 80 m high and taper from a base diameter of 4 to 5 m to about 2.5 m at the top. The towers will be finished with a durable matte (non reflective) epoxy coating. The lower section of the towers will be coated with a band of grey-green colour (e.g. Pantone 427 C). The blades and the upper part (above 10m) of the towers will be coated with a very pale grey-blue (e.g. RAL 7035 for the nacelle and blades, Pantone 427 C for the tower to blend with the sky and which will minimise visibility).

- The towers will be bolted to a reinforced concrete base about 3 m thick and 12 m in diameter which will be supported by driven concrete piles.
- The generator and gearbox assembly will be enclosed in a streamlined nacelle, have an upwind hub to support the rotor, and be connected to the tower by a bearing to allow the assembly to pivot to maintain alignment with the wind direction.
- Each rotor will have 3 variable-pitch blades and rotate in a clockwise direction at between 10 and 25 revolutions per minute (the pitch of the blades will be controlled automatically to maintain the optimal power generation efficiency in response to changing wind speeds, while the blades will "feather" during very strong winds to prevent over speeding).
- Each FRP (fibre reinforced plastic) rotor blade will be about 41 m long and finished in a durable grey coloured surface coating with a low reflectivity (to minimise visibility and "glint" effects).
- The 10 to 15 turbines will operate simultaneously, but independently of one another. They will start to operate in wind speeds of 3-4 m/s (the "cut in" speed) and will "cut out" (by feathering) at wind speeds over 25 m/s as a safety feature.

Underground cabling

- The wind turbines will be connected by an underground cabling system. The cables will be bedded in sand in a 600 mm deep trench and backfilled with excavated material. The cables will be armoured with steel wire and the alignment identified with PVC markers.

Figure 8 Typical Wind Turbines

Relevant planning provisions

Zoning

All properties and land involved is governed by the planning Farming Zone (FZ). This zone is primarily designed to promote the use and development of land for farming purposes, including: the retention of productive agricultural land and use for agriculture, to ensure that non-agricultural uses (particularly dwellings) do not adversely affect these uses, encourage sustainable practices, protect and enhance natural resources and biodiversity and promote the State Planning Policy Framework (SPPF) and the Local Planning Policy Framework (LPPF) (including the Municipal Strategic Statement (MSS) and local policies).

It is interesting to note that *Geothermal Energy Extraction* is listed as a Section 1 'as-of-right' use within the FZ (no permit required). The FZ further states that a *Renewable energy facility (other than a Wind Energy facility)* is noted as a section 2 'permit required' use if it complies with Clause 52.42[2].

Instead, a *Wind Energy Facility* is specifically listed as a section 2 (allowed with a permit) use if it meets the requirements of Clause 52.32 (which will be later discussed).

The decision guidelines for a development are based upon the FZ purposes. These include the ability for the development to promote the SPPF, LPPF, MSS and other local policies. Furthermore, specifically the FZ is designed to assess developments upon agricultural issues, including: whether it will support or enhance agricultural production, permanently remove these abilities. Environmental issue are also paramount, including: impact upon the natural physical features and resources in the area such as on soil and water quality, flora and fauna. Design and siting issues, in particular the impact of the development upon nearby land (and dwellings) is also an issue for assessing a development in the FZ.

Overlays

As outlined earlier, there are several parcels of land involved within the development of the St Clair wind project. Two overlays affect two of these particular parcels of land.

The site 28D Lynnes Road is affected by the Land Subject to Inundation Overlay (LSIO) and the corresponding LSIO Schedule.

[2] Clause 52.42 is the Renewable Energy Facility (other than Wind Energy Facility and Geothermal Energy Extraction) particular provision.

The site 95 Lynnes Road is affected by the Environmental Significance Overlay (ESO) and the corresponding ESO Schedule 4 and the LSIO overlay and schedule. This is due to the property's proximity to the Powlett River.

The LSIO is designed to identify land in a flood storage or flood fringe area affected by the 1 in 100 year flood (or other areas identified by the floodplain management authority), to ensure the free passage and temporary storage of floodwaters, minimises flood damage, compatibility with flood hazard and local drainage conditions and will not affect accelerated flood levels or velocity. The protection and improvement of river, wetland, waterway and flood plain health is also encouraged. A permit is required to carry out or construct works including roadwork's or a fence (required for the St Clair wind farm), involving the creation of a local floodplain development plan.

Furthermore, the Schedule to the LSIO explicitly states that a permit is required to construct a windmill (and solar units).

The ESO is designed to specifically identify areas where development may be affected by environmental constraints and to ensure that development is compatible with identified environmental values. A permit is required for many uses and development, including construction of building or works, a fence, and the removal, destruction or lopping of any (including dead) vegetation (a series of exemptions including noxious weeds or regrowth).

Schedule 4 to the ESO however applies to this particular property (95 Lynnes Road), stating specifically that *no* planning permit is required to remove, destroy or lop any vegetation upon this property, or to construct a non-habitable building (such as a building for wind turbine maintenance).

Clause 52.32 'Wind Energy Facility'

This clause is designed 'to facilitate the establishment and expansion of wind energy facilities, in appropriate locations, with minimal impact on the amenity of the area'.

It states that a development application for a wind energy facility must be accompanied by:

- A site and context analysis, including:
  - A site plan, photographs or other techniques to accurately describe the site and surrounding area.
  - A location plan showing the full site area, local electricity grid and access roads.
- A design response, including:
  - Detailed plans of the proposed development.

- Accurate visual simulations illustrating the development in the context of the surrounding area and from key public view points.
- A rehabilitation plan for the site.
- A written report(s), including:
  - An explanation of how the proposed design derives from and responds to the site analysis.
  - A description of the proposal.
  - A description of how the proposal responds to any significant landscape features for the area identified in the planning scheme.
  - An assessment of:
    - The visual impact of the proposal on the landscape.
    - The visual impact on abutting land that is subject to the National Parks Act 1975.
    - The impact of the proposal on any species (including birds and bats) listed under the Flora and Fauna Guarantee Act 1988 or Environment Protection and Biodiversity Conservation Act 1999.
    - the noise impacts of the proposal on existing dwellings prepared in accordance with the New Zealand Standard NZ6808:1998, Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators.
    - The impacts upon Aboriginal or non-Aboriginal cultural heritage.
  - A statement of why the site is suitable for the wind energy facility.
  - An environmental management plan including any rehabilitation and monitoring.

Relevance of the SPPF and LPPF (including MMS)

The SPPF contains clause 15.14 'Renewable Energy', which states that its objective is to: 'To promote the provision of renewable energy in a manner that ensures appropriate siting and design considerations are met'. It further states that the implementation of renewable energy in Victoria follow the following principles:

- Planning should facilitate renewable energy development in appropriate locations.

- Planning should consider the economic and environmental benefits to the broader community of renewable energy generation and the effects on the local environment.
- In planning for wind energy facilities, planning should:
    - Facilitate the consideration of wind energy development proposals;
    - Recognise that economically viable wind energy facilities are dependent on locations with consistently strong winds over the year and that such sites may be highly localised; and must take into account the Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria.
- In considering proposals for renewable energy, planning and responsible authorities should have regard to the Renewable Energy Action Plan, July 2006.

The Shire of Bass Coast LPPF states a key issue (clause21.03) within land uses as being the promotion of commercial interests, including the growth of the local economy and employment prospects. Furthermore, agricultural land uses state that diversifying the agricultural industry and developing increased rural industries in the Shire are encouraged. The wind farm would accommodate all of the principles of the Key Issues within the LPPF. The 'environmental concerns of the Shire, including 'seeking a balance between urban growth of coastal communities and planning for the effects of climate change' would be addressed by the increased use of appropriate renewable energy in the Shire, which the development greatly illustrates. It further addresses other environmental key issue aspects such as 'conserving and enhancing of the municipality's biodiversity'. Further concerns such as the management and protection of waterways are addressed by the inclusion of planning controls such as the LSIO and ESO, which will be addressed by Synergy within the final development proposal. Clause 21.04 of the LPPF contains the Vision for the Shire of Bass Coast. The Vision for the Shire's 'Environmental Sustainability' is to 'ensure the natural assets of Bass Coast are provided and managed in a sustainable manner so they can be enjoyed now and by future generations'. Additionally, the 'Business Prosperity' Vision for the Shire is to 'create an economic environment that increases wellbeing and prosperity in the Shire'.

The Wind Energy and Policy Planning Guidelines ('the Guidelines')

These Guidelines were introduced in August 2002 to provide a consistent, state planning policy framework for wind farms in Victoria, and have recently been updated in September 2009. They stipulate a clear planning approval process for wind farms in Victoria, being:

- Projects above 30MW (including combined projects of 30MW) require consent from the Planning Minister. The Minister may convene a Panel Hearing to advise upon the project, however ultimately the Minister is not legally obliged to take Panel's recommendation into account.

- Projects below 30MW require consent from the local municipal council (in this instance the Shire of Bass Coast).

- The Minister is able to call-in any development application below 30MW if it affects state planning policy.

The development plan for the St Clair wind farm does not exceed 30MW, and as such it is expected that the development will be assessed by the Shire of Bass Coast.

The Guidelines further state a series of requirements for developing a wind farm in Victoria, including:

- Pre-application consultation with community and stakeholders (note – this is not a formal statutory requirement of the planning process, however it is highly advised that proper notification prior to the application lodgement occur).

- Approval that the development will not affect Victorian Parliamentary Acts including: the Environment Effects Act 1978, the Aboriginal Heritage Act 2006 and the Flora and Fauna Guarantee Act 1988 (FFG Act); and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Native Title Act 1993.

- The necessity for an Environmental Effects Statement (EES) is satisfied by the Minister for Planning.

This development will also comply with the Australian Wind Energy Association's (AusWind) 'Best Practice Guidelines for Implementation of Wind Energy Projects in Australia' as published by the Clean Energy Council.

Restrictions upon development

Restrictions upon development can be sorted into the categories of restraints linked to traditional wind farm development barriers and obstacles unique to this site and the Shire of Bass Coast.

Traditional barriers to wind farm development:

- Possibility of third-party objections – Under the Victorian Planning System, a wind farm development may be objected against at the Victorian Civil and Administrative Tribunal (VCAT), commonly under section 82, an appeal against the decision of the responsible authority to grant a permit (i.e. a neighbour can object to the Shire of Bass Coast granting a permit for the development). Such objections however only apply for developments below 30MW (as developments over 30MW are assessed by the State rather than Local Government).
- Hostility towards wind farms – Wind farms have received enormous criticism since their development in Australia (and worldwide) for issues including aspects of noise, visual blight and prominence, energy efficiency and adverse health effects. Any development invariably is subject to such criticism, and the St Clair wind far will not be an exception. [3]

Barriers unique to the Shire of Bass Coast:

- Scenic prominence of the region - Whilst St Clair is not located directly upon the coastline (as other wind energy developments including the 4-stage Portland project); it is still located within a region recognised for scenic beauty and quality. This is of particular importance for wind farm developments, as the turbines are easily observed from up to a minimum of 5 kilometres away.
- Planning zones and overlays upon the site in question – As outlined above, the FZ applies to this land, and the LSIO and ESO (and Schedule to the LSIO and Schedule 4). The LSIO can be managed via a local floodplain development plan and the ESO by meeting the guidelines of the overlay, the FZ states that Clause 52.32 (above) must be satisfied.

Opportunities for development

Whilst a number of barriers have been highlighted above, a number of opportunities are present which favourably promote the success of this wind farm project in particular:

- The Wonthaggi Desalination project – Due to be completed in 2011 and requiring a constant 80MW power, the St Clair wind farm presents an opportunity to 'offset' part of this long-term development. Furthermore, the possible expansion of this wind farm would further power the desalination project, whilst powering the wider Bass Coast region.

[3] As seen recently in the article 'Wind blows again' available online at http://www.thestar.com.au/Public/Template2/ThreadView.aspx?tid=24774

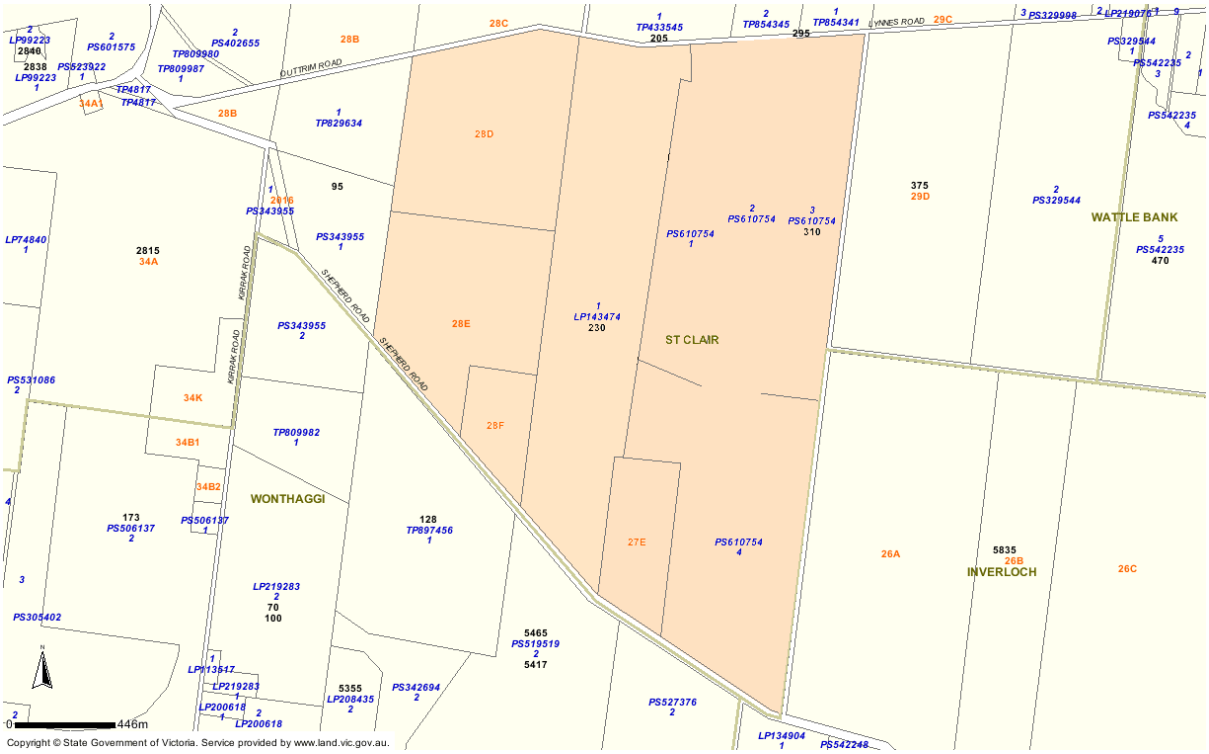
- Increasing promotion of renewable energy in Victoria (and Australia) – In recent years, the growth of wind energy has greatly accelerated. Currently in Victoria over 427.7MW capacity are installed. As such, the further development of wind farms and the utilisation of areas with high wind yields, including Wonthaggi, are to be expected. Furthermore, as previously mentioned, there is an increasing trend for wind energy development to be located in less coastal areas to avoid complications (such as large community opposition and the development conflicting with areas of great coastal scenic beauty such as observed upon the Great Ocean Road) and utilise high wind yields in more in-land locations.
- Regional economic benefits – This wind farm development will contribute to the regional economic development of Wonthaggi and the greater Shire of Bass Coast in a number of ways. Firstly, and most obviously, economic benefits will be felt by private land owners which will be involved within the development (leasing of land for turbines). The project would also add to the Shire's annual rates, important for all Shires and Councils. Construction of the development and maintenance of the turbines will be felt by labourers, technicians, and other highly skilled professionals in the areas. Additionally, this development would potentially 'pave the way' for future wind farm development in the region, further harnessing future economic activity. This would also cement the Shire of Bass Coast, and this region of Victoria, as a leading promoter of renewable energy (an industry expected to further accelerate in coming decades).

Properties involved

At current stages, the properties involved in the St Clair wind farm project are:

- 28D Lynnes Road, St Clair
- 28E Lynnes Road, St Clair
- 28F Lynnes Road, St Clair
- 95 Lynnes Road, St Clair
- 230 Lynnes Road, St Clair
- 310 Lynnes Road, St Clair

Figure 9 Properties of the St Clair wind farm



Summary of proposal

In summary, this proposal involves the construction and operation of a 30 MW wind farm installation upon a series of privately owned properties in the township of St Clair, within the Shire of Bass Coast. The development will involve 10-15 wind turbines, a small on-site sub-station and access tracks linking these facilities. This development plan has been formulated in accordance with the Shire of Bass Coast's planning policies, Victorian wind energy guidelines, and will be constructed in complete accordance with structural design standards. It will further operate and be decommissioned in accordance with a detailed Environmental Management Plan, which will be approved by Council as part of the development review process. It is expected to operate and generate renewable, clean energy, for at least 20 years on a continuous basis (except when wind speed is less than 3-4 m/s or over 25 m/s).

References

Bass Coast Shire Council (2009), *Town Maps,* available online at http://www.basscoast.vic.gov.au/content/content.asp?cnid=1472

Department of Planning and Community Development 2009, *Planning Maps Online*, available online at http://services.land.vic.gov.au/maps/pmo.jsp

Sustainability Victoria, State of Victoria 2008, *Wind Resources in Victoria,* available online at http://www.sustainability.vic.gov.au/www/html/2111-wind.asp