

Yorke Peninsula Wind Farm Project Pty Ltd

**Ceres Project Section 49 (Crown Development)  
Submission Response Document**

27 August 2013

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# 1. Introduction

Yorke Peninsula Wind Farm Project Pty Ltd (YPWFP) is seeking development authorisation for the construction and operation of a wind farm on Yorke Peninsula in South Australia, known as the Ceres Project. YPWFP will alternatively be referred to throughout this document as *the Proponent*.

YPWFP is a Suzlon Group controlled Company. The activities of the Suzlon Group in Australia are performed by REpower Australia Pty Ltd. The Ceres Project is a business name registered under YPWFP.

The Ceres Project is being assessed pursuant to Section 49 of the *Development Act 1993* as key public infrastructure. The project sponsor for the development application is the Office of Major Projects and Infrastructure (OMPI) of the South Australian Department of Transport, Planning and Infrastructure (DPTI).

This Response Document has been prepared by the Proponent to formally respond to the Development Assessment Commission (DAC) on matters raised by public and government submissions on the Development Application for the Ceres Project (the Development Application).

## 1.1 Background to project

The proposed Ceres Project (the Project) would be located on the Yorke Peninsula, near the townships of Port Julia and Port Vincent, approximately 20 kilometres south-west of Ardrossan.

The Proponent has sought approval under Section 49 of the *Development Act 1993* as the Project is considered to be key public infrastructure and is comprised of the following components:

- Up to 199 wind turbines spread over four project zones, covering an area of approximately 180 square kilometres.
- Access roads and other associated infrastructure to support the wind farm, including temporary equipment storage areas, underground electrical cabling and switching infrastructure.
- HVDC cable connection to Adelaide across Gulf St Vincent, including approximately 60 kilometres of marine cable and 14 kilometres of terrestrial cable, linking the Project to ElectraNet's network on the eastern side of the Gulf.
- Operations compound and two High Voltage Direct Current (HVDC) converter stations – operations compound and one converter station located on the western side of the Gulf near Port Julia, and second converter station located on the eastern side of the Gulf near Parafield Gardens West substation.
- A low voltage alternating current (AC) underground cable transmission connection from the western converter station to the Rex Minerals Hillside Project site.
- Underground high voltage AC cable transmission connection from the Parafield Gardens West converter station to the nearby ElectraNet substation.
- A temporary concrete batching plant located adjacent to the operations compound on 12 Mile Rd, covering an area of approximately 9,000 m<sup>2</sup>.
- Up to 8 permanent meteorological measurement masts of height 100 m equipped with a range of instruments used to measure weather conditions.
- Associated site and civil works (including the excavation/filling of land, site clearance etc).

## 1.2 Project update

### 1.2.1 Supporting studies

Following initial lodgement of the Development Application in January 2013, the Project's Aerial Application Assessment<sup>1</sup> (the Aerial Spraying Report) and the Ceres Project Noise Impact Assessment<sup>2</sup> (the Noise Impact Assessment), which were attached in support of the Development Application, were updated to provide greater detail on analysis of potential impacts.

As a result of submission of updated versions of these reports, the Project's public exhibition period was extended by three weeks, from 28 March 2013 to 18 April 2013, in order to allow the public and relevant agencies further time to review the Development Application and prepare submissions.

Following the exhibition period, and in order to address matters raised in some of the submissions received, the Proponent has undertaken further work in relation to the Aerial Spraying Report and the Noise Impact Assessment.

Detail regarding the updates to these reports and the further work undertaken following the exhibition period is set out in the sections below.

#### 1.2.1.1 Aerial Spraying Report

As a result of ongoing stakeholder consultation, the Aerial Spraying Report was updated following the initial lodgement of the Development Application for the Project to include further detail on potential aerial application impacts through amendments to Appendices C and D of the document, which assess the possibility of impacts to aircraft turning potential and associated potential for decreased efficiency of aerial application on properties adjacent to the Project.

According to the Aerial Spraying Report, existing farming practices on the Yorke Peninsula are dominated by ground application and it is estimated that only 20 per cent of chemical and fertiliser applications are currently undertaken by fixed-wing aircraft.

The report found that the total area around the wind farm potentially affected by reduced capacity for fixed wing aerial spraying is 288 ha and concluded that the impact of the wind farm on agricultural aircraft application efficiency is relatively small (primarily due to the design decision to have no overhead power lines) even before the implementation of further mitigation measures.

A copy of the updated Aerial Spraying report was made available to the public and relevant agencies during the exhibition period for the Development Application.

Following update of the Aerial Spraying Report and a survey of non-involved landowners adjacent to the Project who use aerial agricultural services, the Proponent engaged in discussions with Aerotech Australasia, the sole provider of fixed-wing spraying services on the Yorke Peninsula, to seek to ameliorate potential impacts on aerial spraying arising from the Project. A binding agreement has since been executed between Aerotech Australasia and the Proponent that eliminates any impact of the wind farm on aerial agricultural services in the area through the provision of communications and operational procedures that ensure aerial spraying can be and is undertaken safely around the wind farm.

The findings of the Aerial Spraying Report and the agreement with Aerotech Australasia are discussed further in Section 2.6.4.2 of this Response Document.

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<sup>1</sup> Ambidji Group (2012). *The Ceres Wind Farm Project Assessment of Agricultural Applications for Fixed Wing Aircraft V8*, 19 December 2012

<sup>2</sup> Marshall Day Acoustics (2013). *Ceres Wind Farm Noise Impact Assessment*

### 1.2.1.2 Noise Impact Assessment

In response to feedback received on 12 February 2013 from the Environment Protection Authority (EPA) on information originally submitted with the Project's Development Application, an updated version of the Noise Impact Assessment was issued on 20 March 2013. This updated version of the Noise Impact Assessment was made available to the public and relevant agencies during the exhibition period.

Following further engagement with the EPA, a further revised version of the Noise Impact Assessment was prepared in July 2013 and provided to the EPA. A copy of this revised version of the Noise Impact Assessment (R04 dated 19 July 2013) is attached as Appendix A to this Response Document.

The updated Noise Impact Assessment was structured to address feedback from the EPA, which is broadly outlined in Table 1.1 below.

**Table 1.1 Status of responses to EPA feedback on the Noise Impact Assessment**

EPA feedback	Response to EPA feedback	Description of response and current status
EPA requested further detail on the occupancy status of six relevant receivers located close to Project turbine locations, on properties belonging to stakeholders involved in the Project.	The Proponent has binding agreements with owners of these receiver locations that ensure that the buildings are not occupied during the life of the wind farm and has briefed the EPA on this issue. Only two of these receivers are currently occupied and their owners have elected to use these areas of their land to host turbines by changing the use of the buildings.	The Proponent has provided the EPA and DAC with relevant documentation confirming the arrangements in relation to these receivers.  No further action required.
EPA requested clarification of the methodology used to derive octave band sound power and tonality data for the proposed model of turbine in accordance with the wind speed range detailed in relevant EPA Guidelines.	The Proponent has liaised with the EPA on methodology on derivation of the proposed turbine's octave band sound power and tonality data.	The Proponent has provided updated documentation and reporting to the EPA outlining data sources and methodology used to produce acoustic modelling data.  No further action required.
EPA requested clarification of the relevant referenced baseline limit (dB(A)) used for commercially involved stakeholders in the Noise Impact Assessment, according to relevant Guidelines.	The baseline criterion of 45dB(A) for involved stakeholders has been clarified in the updated Noise Impact Assessment.	No further action required.

As a result of this engagement with the EPA, further detail on the assessment of noise impacts from the Project's proposed HVDC converter stations is provided in Section 2.5.1.3 of this Response Document and the potential environmental impacts on Barker's Inlet during installation of the HVDC marine cable are discussed in Section 2.5.11.

## 1.2.2 Amendments to application

The Development Application is amended, clarified/qualified, and further detailed in the following respects:

### 1.2.2.1 Approval timeframe

Given the estimated two and a half year construction timeframe, which includes the preparation of the documentation associated with the Project, the Proponent seeks an approval with the following timeframes:

- substantial commencement: 18 months; and
- substantial completion: 5 years.

### 1.2.2.2 Alteration of building use at selected sites

It is proposed, as an integral element of the Development Application, to change the use of the six residences closest to turbines to farm use only. The Proponent has entered into binding agreements in relation to each of the buildings belonging to stakeholders involved in the Project, identified on the proposed plans as 259, 266, 300, 312, 315 and 316 that have the effect of prohibiting use of the buildings for accommodation purposes during the life of the wind farm. Each building is to be used for the purposes of farm buildings only. This position can be further formalised by way of a change of use under the Development Act such that each of the buildings is only authorised for storage, administration and allied purposes and is not authorised to be put to any permanent, or temporary, accommodation purpose whether for family members, farm workers, or visitors/tourists. Only two of these involved stakeholder properties are currently occupied and each landowner has elected to allow the use of their building to be changed to allow turbines to be sited in the area.

### 1.2.2.3 Number of wind turbines

Whilst the Development Application seeks approval for a wind farm of up to 199 turbines, following completion of the project investigations and technical assessments provided with the application, that number has been reduced with the removal of turbine 221. Further detail on the removal of turbine 221 from the design of the Project is provided in section 2.11 of this document.

The final number of turbines may be further reduced to provide for additional separation between turbines and sensitive land uses, and/or to ensure compliance with the EPA Wind Farms Environmental Noise Guidelines 2009 (in respect of a residential dwelling approved subsequent to the lodgement of the Development Application, if constructed).

Under separate cover a condition has been proposed to apply to the micrositing, relocation or removal of turbines from the proposed layout. The effect of the suggested condition is that the Proponent has flexibility to microsite turbines within a 100 m radius of the proposed location, to relocate turbines to ensure compliance with the EPA Wind Farms Environmental Noise Guidelines and to delete turbines from the final layout.

In addition, the final turbine layout must be assessed by a specialist noise consultant to ensure its conformity with the EPA Guidelines in respect of dwellings in existence or under construction as of the 3 July 2014. Evidence of the Project's compliance with EPA Guidelines must be submitted to the reasonable satisfaction of the EPA prior to the construction of any turbines taking place.

## 1.3 Development approval process

Following receipt of submissions from agencies and the public on the Project the Proponent has prepared this Response Document.

Upon receipt of this Response Document, DAC will prepare an Assessment Report in relation to the Project which will be provided to the Minister for Planning.

Following consideration of the Assessment Report and other documentation, the Minister will make a decision whether to approve or refuse to approve the Project. There are no rights of appeal against the Minister's decision.

## 1.4 Further approval requirements

It will be necessary for a number of additional approval requirements to be satisfied prior to commencing construction of the Project.

### 1.4.1 Native vegetation clearance

While avoiding native vegetation was fundamental to the design layout of the Project, some vegetation clearance will be necessary to facilitate construction of elements of the Project as proposed in the Development Application. Any clearance of native vegetation will require approval under the *Native Vegetation Act 1991*.

Given the nature of the Project this clearance is likely to be assessed under Regulation 5(1)(d) or 5(1)(da) of the *Native Vegetation Regulations 2003*.

These Regulations are relevant to clearance for the provision of infrastructure or development and are likely to be applicable to the Project. Under each of these regulations, a Significant Environmental Benefit (SEB) will be required to offset the native vegetation proposed for clearance. A number of landowners involved in the Project have expressed interest in providing native vegetation offsets to the Project from their land holdings.

### 1.4.2 Water affecting activities

A Water Affecting Activity permit (WAAP) may be required under the *Natural Resources Management Act 2004* for any activity that may impact on the health and condition of water resources in the region.

Permits may be required for water affecting activities in accordance with Section 5, Water Affecting Activities of Volume D, Regulatory and Policy Framework, of the Northern and Yorke Natural Resources Management Board's Regional Natural Resources Management Plan.

The Proponent will liaise with the Northern and Yorke Natural Resources Management Board to obtain any necessary permits prior to any works commencing near a watercourse.

### 1.4.3 Cable installation

The Proponent will be required to obtain a number of approvals prior to commencing seabed investigations for the marine cable. This process may require approvals in accordance with the following legislation:

- *Native Vegetation Act 1991* – drilling investigations for the HVDC marine cable may involve some clearance of seagrass, subject to consideration of the other options identified to avoid and mitigate potential impacts.
- *Harbors and Navigation Act 1993* – a seabed licence will be required from DPTI to provide access over the water and seabed. The licence will be required for preliminary works, which may include soil sampling or other potential seabed disturbance.
- *Harbors and Navigation Act 1993* – approvals may be required to allow the use of stationary investigation vessels.

Following investigative work, the Proponent will have further details on the extent of dredging operations required for installation of the HVDC marine cable and will liaise with the EPA on potential environmental impact and associated mitigation measures resulting from cable installation. Including but not limited to the following:

- *Environment Protection Act 1993* – environmental authorisation is required from the EPA for ‘dredging’, ‘discharge to marine waters’ and ‘earthworks’ which are all prescribed activities of environmental significance under Schedule 1 of this Act. The proposed method of jet trenching and ploughing may constitute ‘dredging’ under this legislation and as such would require authorisation from the EPA.
- Development of a Turbidity Monitoring Program in accordance with the *Environment Protection (Water Quality) Policy 2003*.
- Preparation of a Dredge Management Plan once an understanding of the extent and scope of dredging operations (jet trenching and ploughing), Horizontal Directional Drilling (HDD), surface cable laying and other associated activities has been determined. This Plan will need to comply with the EPA Guidelines for Dredging and Earthworks Drainage.
- Development of a Marine Pest Management Plan to be used during installation of the HVDC cable. This Plan will be developed in the detailed design phase of the Project following completion of investigative surveys, including a survey for the presence of the invasive marine algae *Caulerpa taxifolia* along the final optimised cable route. The Proponent will consult with the EPA and the South Australian Research and Development Institute (SARDI) on the methodology and scope of survey for *C. taxifolia*.

In addition to the further possible approval requirements listed above, the Proponent will liaise with the Coast Protection Board regarding existing coastal acid sulfate soils at the coastal interface, particularly at St Kilda. An Acid Sulfate Management Plan will be developed as part of construction management to prevent or minimise disturbance to acid sulfate soils at the land/sea interface points.

A Cultural Heritage Management Plan will be developed to manage the coastal interface of the proposed marine cable, given the potential archaeological sensitivity of these areas. The Proponent will liaise with the relevant Aboriginal groups for intertidal investigations of these coastal interface areas.

#### 1.4.4 Temporary concrete batching plant

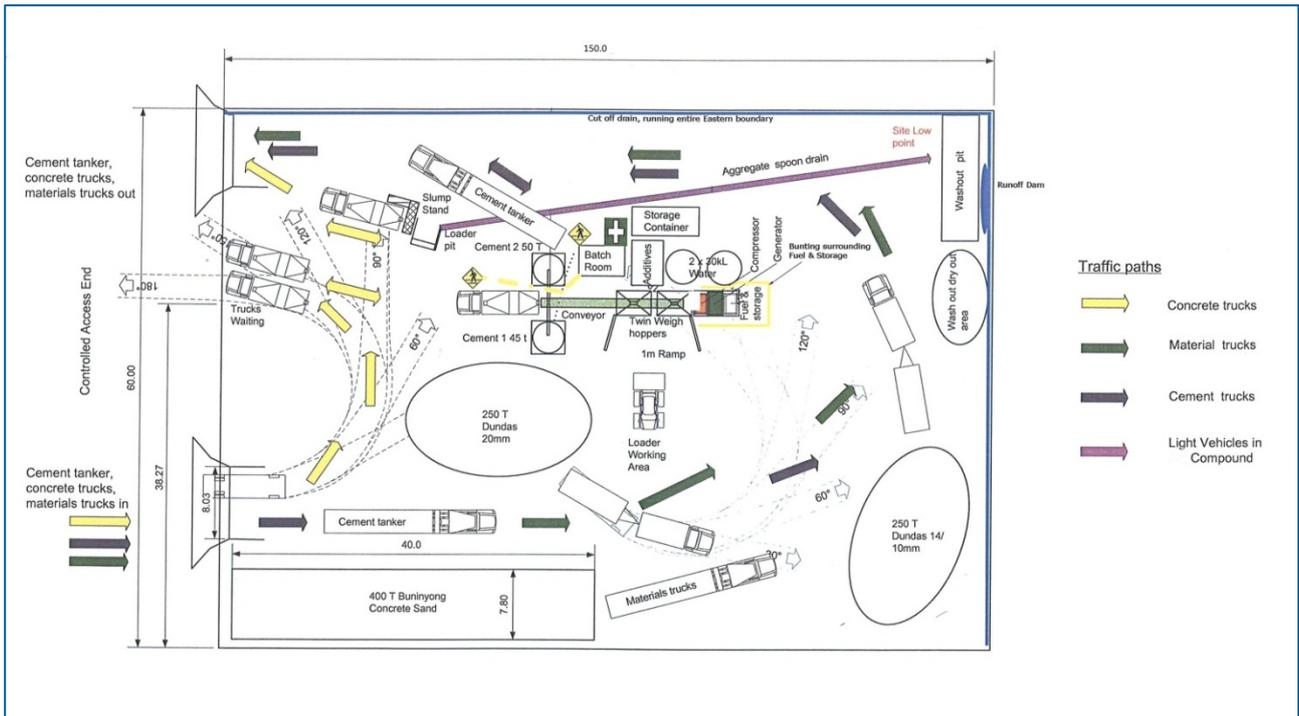
Environmental authorisation will need to be obtained from the EPA for activities classified as prescribed activities of environmental significance under Schedule 1 of the *Environment Protection Act 1993*.

Concrete batching is described as a prescribed activity in Schedule 1(2)(5) of the Act as ‘Concrete Batching Works’ being the conduct of works for the production of concrete or concrete products that are manufactured or are capable of being manufactured by the mixing of cement, sand, rock, aggregate or other similar materials, being works with a total capacity for production of such products exceeding 0.5 cubic metres per production cycle.

The contractor will need to obtain authorisation in the form of a licence from the EPA prior to such activities being undertaken in the construction of the wind farm.

The temporary concrete batching plant used during construction will be sized to accommodate a complete foundation pour each day. A wind turbine foundation will comprise approximately 475 m<sup>3</sup> of concrete, and the temporary concrete batching plant will occupy an area of approximately 9,000 m<sup>2</sup>. The temporary plant will be located adjacent to the operations compound on 12 Mile Rd.

A typical batching plant arrangement is shown in Figure 1.1 below.



**Figure 1.1 Typical concrete batching plant arrangement**

There are a number of potential impacts associated with the operation of the temporary concrete batching plant, including dust emissions, noise, waste and wastewater. The Scope Construction and Environmental Management Plan (CEMP) for the Wind Farm outlines a number of specific mitigation measures to manage the potential environmental impacts (refer Appendix B).

## 1.5 Construction and Operation Management

### 1.5.1 Wind farm construction management

A Construction and Environmental Management Plan will need to be developed to manage potential impacts associated with the construction of the Project.

A Scope CEMP was developed as part of the development application to identify the environmental management and mitigation measures to be implemented by the Proponent and its Contractor(s) during the construction of the proposed wind farm and associated infrastructure. A copy of the Scope CEMP was attached to the original Development Application as Appendix A. A copy is also attached to this Response Document as Appendix B.

The Proponent will need to develop a number of management plans to cover the following environmental issues and each plan will include specific management measures:

- visual amenity
- noise and vibration management
- air quality and dust management
- flora and fauna management
- Indigenous and non-indigenous heritage management
- traffic and access
- erosion and stormwater management
- waste management
- storage and handling of hazardous substances
- weeds and pest management

- water quality management (terrestrial)
- emergency and fire management.

## 1.5.2 Traffic Management Plan

As detailed in Section 2.5.9 of this Response Document, a Traffic Management Plan will be prepared in consultation with the Council and the DPTI during the detailed design phase of the Project and will be approved prior to commencement of construction. Road safety will be a key objective in the development of this plan.

Some of the standard practice measures included in Traffic Management Plans for wind farms are:

- reduction of speed limits
- use of additional signage (education/traffic management)
- restriction of vehicle movements at certain times of day
- reduction of light vehicle movements outside of standard construction hours (i.e. project bus for central locations with project accommodation)
- establishment of a complaints management system – including a hotline; and
- monthly reporting on performance to stakeholders (i.e. Council/DPTI).

## 1.5.3 Mitigation Measures for Converter Station

The design of the converter stations (potentially affecting a single residence at Port Julia and a number of residences proximate to the Parafield Gardens station) will be configured to ensure compliance with the EPA Wind Farms Environmental Noise Guidelines 2009 and the South Australian Environment Protection (Noise) Policy, 2007 by measures including those set out in the Noise Impact Assessment and Noise and Vibration Assessment. The Proponent agrees to submit details of proposed mitigation measures to the reasonable satisfaction of the Environment Protection Authority prior to the grant of the Building Rules consent.

## 1.5.4 Road maintenance and reconstruction proposal

The Proponent will ensure that in the course of construction:

- articulated semi-trailer and over-dimensioned vehicles will be confined to roads designed for, or suitable for such purposes; and
- vehicle load and dimension limits will be placed on the use of all other roads, such limits to be determined by the Proponent in consultation with Council based on the expected duration and frequency of such movements, the agreed maintenance regime for such roads and the expected public use made of those roads.

The maintenance regime over the course of construction and the condition of those roads at handover upon completion of the project (to be carried out by the Proponent), will be determined by the Proponent in consultation with Council.

All related matters to road and access features and the Proponent's responsibility during construction of the Project will be detailed in the Traffic Management Plan (TMP) to be prepared to Council's reasonable satisfaction and approval prior to the grant of a Building Rules consent.

## 1.5.5 Measures to eliminate/lessen electromagnetic interference with radio communication systems

The wind farm is designed to avoid a line of sight issue for existing radio communication installations and hence minimise impact on the operation of such systems. Nonetheless, the Proponent will:

- further investigate the experience with similar wind turbine technology adopted, for example, at the Bluff Wind Farm to establish any electromagnetic transmission interference issues from wind farms and evaluate the effectiveness of any remedies adopted including modification of operating procedures or any adjustments required to radio communications systems at such locations
- engage the local operators and industry representatives to devise a testing regime and response process to be put in place for the Project; and
- document an agreed testing and monitoring regime and an engagement process to identify and resolve issues as they arise.

### 1.5.6 Operational management

The Proponent will prepare an Operational Management Plan in consultation with DPTI, DCYP and other relevant industry stakeholders to provide strict protocols governing issues such as:

- operational environmental management
- operational water usage
- maintenance processes during operation of the Project where relevant
- bush fire risk management
- emergency response planning
- operational traffic management.

### 1.5.7 Management of impact on bats

The proposed turbine layout has been informed by a flora and fauna management plan prepared by ecologists at EBS in order to minimise impact on important habitat where, amongst other things, bat species are considered likely to live. The management plan also covers construction management issues. A monitoring program is proposed in the post-construction stage to better understand the interaction of bats and turbines. The management plan identifies a number of responses available in the event that bat impact is considered an issue and requires a response, including the use of markers and radar technology. The post-operational monitoring and management of this matter is integral to the Development Application and the detail of these services and management measures is to be submitted to the reasonable satisfaction of the EPA prior to the receipt of Building Rules consent.

## 1.6 Public exhibition of Development Application

The Development Application for the Project was lodged with the Department of Planning, Transport and Infrastructure (DPTI) in January 2013.

A 'Notice of Application for Consent to Development' was published in *The Advertiser* on 12 February 2013, inviting members of the public to make written submissions on the Development Application to the Development Assessment Commission (DAC). The public exhibition period commenced on 12 February 2013 and was set to conclude on 28 March 2013, however the exhibition period was extended to 18 April 2013 after updated versions of two supporting appendices were submitted by the Proponent. Copies of the Development Application were made available for viewing at a number of locations on the Yorke Peninsula and metropolitan Adelaide and on the DAC website.

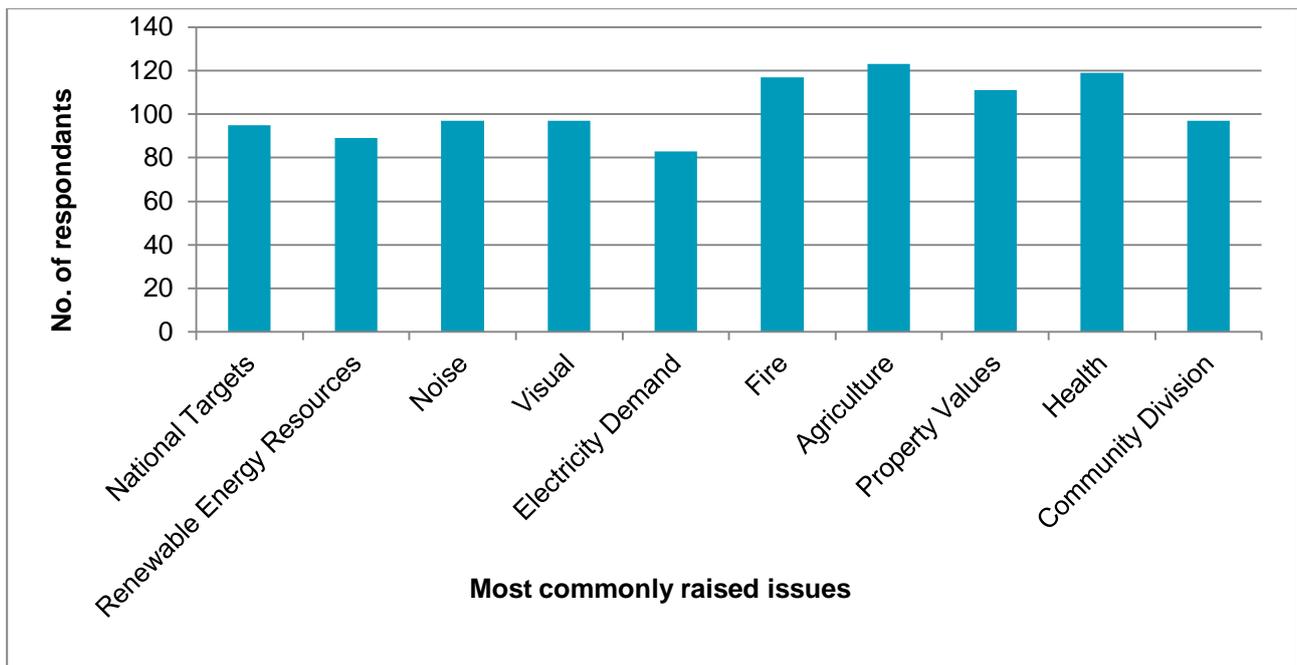
During the exhibition period, three community information days (incorporating 10 separate sessions involving over 300 attendees) were held by the Proponent to provide information on the Project and the approval process and to respond to questions. The following sessions were held:

- Sunday 13 January 2013, 1–4 pm, Curramulka Community Club, Curramulka
- Wednesday 16 January 2013, 5–8 pm, Port Vincent Bowling Club, Port Vincent
- Saturday 19 January 2013, 1–4 pm, Port Julia Community Hall, Port Julia.

## 1.7 Submissions received

During the exhibition period, a total of two hundred and ten (210) submissions were received by the DAC in relation to the Development Application. Figure 1.2 below summarizes the ten most common issues raised in these submissions, with matters relating to continuing agricultural practices, potential impacts on human health and increased fire risk being the three key issues identified.

Of the 210 submissions received, 86.7 per cent (182) opposed the wind farm development, 12.4 per cent (26) were in favour of the proposed development and two did not present either support or opposition. Of the 182 opposing submissions, 8 were duplicate submissions and one was ruled to be invalid by DAC.



**Figure 1.2 Ten most commonly raised issues in submissions**

More than eighty (or over one third) of the submissions received were made by way of a single A4 page pro-forma which listed a number of general concerns in relation to the proposed development. The pro-forma included 22 different matters which are addressed in detail in this Response Document. Table 1.2 summarises these issues and identifies the section of this Response Document where each issue is addressed.

**Table 1.2 Issues raised as listed in pro-forma submissions**

Issue raised	Section addressing issue	Section number
Impact on prime agricultural production including aerial agricultural practices	Agriculture	2.6.4
Applicant's policy to place 71 turbines on non-host's boundaries	Setbacks	2.4.2
Devaluation of surrounding properties	Property values	2.7.4
Restriction to aerial fire fighting within and around the turbine zones	Aerial fire fighting	2.5.4.2
Visual pollution	Visual	2.5.6
Lack of Community consultation and transparency	Community and stakeholder engagement	2.10

Issue raised	Section addressing issue	Section number
Health impacts including sleep deprivation	Health concerns	2.7.1
Noise pollution, both audible & infrasound	Noise	2.5.1
Detrimental impact to flora and fauna	Flora and fauna	2.5.2
Detrimental impact on the marine environment	Marine	2.5.11
Division of rural communities and families	Community division	2.7.2
Damage to rural social infrastructure	Community division	2.7.2
Detrimental impact on tourism	Tourism	2.6.1
Enforced tax payer subsidies to the wind turbine industry	Financial incentives for renewable energy projects	2.6.2
Inefficient and intermittent electricity production	Turbine technology	2.3
Inadequate or non-existent provision for decommissioning and removal of turbines	Decommissioning	2.9
Danger to low flying agricultural/ Danger to emergency retrieval and other aircraft	Aviation impacts	2.6.4.2/2.5.4
Safety issues related to blade throw	Blade throw	2.7.5
Excessive shadow flicker for homes, roads and public spaces	Shadow flicker and blade glint	2.5.7
Greatly increased traffic and road damage during construction	Traffic	2.5.9
Destruction of historic, heritage and cultural areas	Heritage	2.5.10

Note: Each description of the 'issue raised' is directly quoted from the pro-forma response



## 2. Response to agency and public submissions

### 2.1 Approval process and timeframes

A number of submissions raised issues pertaining to the approval process for Section 49 Crown Development, including in relation to the rigour of assessment used to prepare the supporting documentation for the Development Application, and suggested that further analysis of the potential Project impacts be undertaken by other third party organisations.

#### *Response*

At the time of writing, concept design on the site layout has been completed based on a range of supporting studies that have been used to identify potential environmental impacts and scope appropriate avoidance or mitigation measures.

As is common practice for major infrastructure projects in South Australia, the various technical studies underpinning design of the Project were commissioned by the Proponent and have been prepared by reputable specialist consultants engaged to provide independent professional expertise in each relevant area.

The Proponent has provided an assessment of all potential environmental, economic and social impacts associated with the Project in accordance with relevant State and Commonwealth statutory and regulatory guidelines. The Proponent has and will continue to liaise with government, agency and community stakeholders to ensure that where potential impacts arising from the Project cannot be reasonably avoided, they are mitigated through on-going management plans.

The Section 49 Crown Development process for assessment of proposed public infrastructure is transparent and all stakeholders or interested parties have been provided with opportunities to raise matters of concern. The process has been managed by the DAC, which is an independent statutory body that assesses and reports on Crown Development and public infrastructure applications to the Minister for Planning as the decision maker for these developments.

#### 2.1.1 Project timing

##### *Summary of submissions*

Several submissions queried the Project's timetable for the commencement of construction.

##### *Response*

The next stage of the Project will involve detailed design and preliminary investigations on the proposed High-Voltage, Direct Current (HVDC) cable alignment. No construction activities will be undertaken until the Project has received approval from the South Australian Government and the other relevant agencies described in Sections 1.4 and 1.5 of this document.

The following table provides an overview of the Project's indicative construction schedule. The construction of the Project would take approximately two and a half years and based on the current schedule would be completed by early 2016.

**Table 2.1 Indicative project schedule (subject to approval)**

Activity	Indicative start date
Detailed design and tender preparation	Q1 2014
Tender evaluation(s) and selection of contractor(s)	Q1 2014
Civil works (roads, laydown areas, footings and trenches)	Q2 2014
Turbine installation	Q2 2014
Converter station and electrical works (cabling, turbine connection)	Q2 2014
Wind turbine commissioning	Q3 2015
First energisation	Q4 2015
Wind farm operational	Q1 2016
Site revegetation and restoration	Q1 2016

## 2.2 Project need and rationale

### Summary of submissions

A number of submissions queried the need for the development of the wind farm and questioned whether alternative forms of renewable energy had been considered or investigated as possibly more viable alternatives to wind farm development.

### Response

#### 2.2.1 Consistency with national targets

The Commonwealth Government is committed to the provision of adequate, reliable and affordable energy to meet future energy consumption needs, maintain economic growth and meet national targets for use of renewable energy sources, such as wind.

The enhanced Renewable Energy Target (eRET), introduced on 1 January 2011, incorporates two new parts to the Renewable Energy Target scheme; the Small-scale Renewable Energy Scheme (SRES) and the Large-scale Renewable Energy Target (LRET). The LRET is relevant to large scale renewable energy projects such as wind farms, whereas SRES applies to small scale technologies such as roof-top solar photo-voltaic systems.

Requirements of LRET are defined by the *Renewable Energy (Electricity) Act 2000 and Renewable Energy (Electricity) Regulations 2001*. The Clean Energy Regulator is the statutory agency responsible for administration of the LRET.

According to ESCOSA, there are currently 16 wind farms operating across South Australia with an installed capacity of 1,203 Megawatts (MW) of power. The Australian Energy Market Operator (AEMO) estimated that in 2011–12 approximately 24 per cent of the State's energy production came from SA wind farms<sup>3</sup>.

In 2009 the South Australian Government committed to increasing its renewable energy production target to 33 per cent by 2020.

<sup>3</sup> AEMO (2013). *South Australian Historical Market Information Report*, 31 July 2013.

The Project will help Australia to meet its renewable energy commitments and assist South Australia to meet its revised renewable energy target of 33 per cent of electricity production by 2020.

## 2.2.2 Electricity demand

Electricity demand fluctuates throughout each day, meaning that power networks do not provide a constant supply of electricity to consumers. Electricity demand can be thought of in terms of average minimum demand (often referred to as baseload demand), variable intra-day demand and peak demand. Baseload refers to the minimum level of demand that occurs the majority of the time, intra-day demand refers to semi-predictable cyclic changes in demand that occur during each day, whereas peak demand refers to demand during periods of higher than average electricity demand, for example, during high or low temperatures.

A variety of generation assets operate to dispatch energy into the NEM to service the different kinds of electricity demand. Because wind farms operate as semi-scheduled or non-scheduled generators, they supply electricity to customers when it is available from the natural wind resource and contribute to meeting each of these three broad categories of electricity demand.

Demand for electricity is influenced by a range of factors, including the energy intensity of the economy, the level of production in the Australian manufacturing and resources sectors, Commonwealth Government environmental policies, new business investment and new residential development. Because of the relatively stable energy intensity of the Australian economy (GWh/per unit of Gross Domestic Product) growth in manufacturing and resource sectors generally requires additional electricity generation capacity to meet increased demand requirements.

The Project is ideally suited among South Australian wind farms to providing electricity to serve intra-day variations in electricity demand due to the close alignment of its average daily generation profile with intra-day changes in the South Australian electricity demand profile. See Figure 2.1 below.

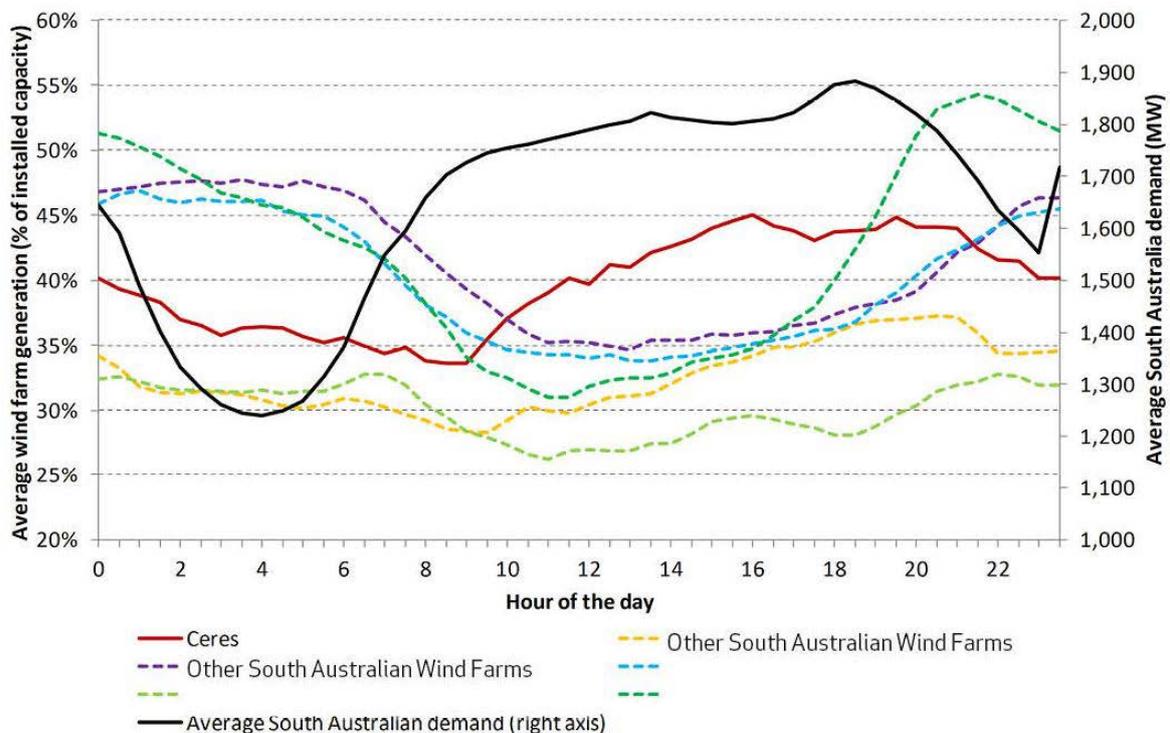


Figure 2.1 South Australian Electricity Demand Profile

## 2.2.3 Renewable energy sources

While coal generation remains the largest source of electricity generation in Australia, there are a range of renewable energy sources that could be utilised to generate electricity, including wind, geothermal, solar and hydro.

Coal-fired power stations are the most common form of electricity generation in Australia, with approximately 75 per cent of Australia's electricity supply generated by black or brown coal-fired power stations<sup>4</sup>. Coal-fired power stations have higher greenhouse gas emissions per unit of electricity produced than other forms of electricity generation and currently account for around 50 per cent of Australia's emissions according to the Clean Energy Council.

### 2.2.3.1 Wind

A number of policy measures, including the LRET, have been introduced to support the development of renewable energy in Australia. Deployment of wind generation is seen as a critical element in meeting the State and Commonwealth Government's 2020 renewable energy targets. Wind energy is the most mature and lowest cost technology able to provide utility-scale renewable energy in Australia, which has excellent wind resources by global standards.

South Australia is considered to have significant potential for wind farm development and renewable energy. The location of the proposed Project will enable wind energy to be captured from both sides of the Yorke Peninsula (south-westerly and northerly), with an expected mean average wind speed in excess of 8 m/s. This has been confirmed by 7 years of wind data gathered from around the site. The high average wind speeds recorded at the site, in conjunction with the excellent alignment of the proposed wind farm's generation profile with SA electricity mean the Project is exceptionally well situated.

Calculating the levelised cost of a unit of electrical energy produced from wind generation depends on a range of factors. The majority of costs associated with wind developments are capital costs, with operational costs relatively small in comparison. Wind energy is currently the lowest cost form of utility-scale renewable energy and is expected to remain so for the foreseeable future<sup>5</sup>.

### 2.2.3.2 Other forms of renewable energy

Although wind farms are the major sources of utility scale renewable energy in the State, there are a number of other sources of renewable energy that are being investigated by various parties for deployment in South Australia, including medium-scale solar photo-voltaic generation and solar thermal generation.

Notwithstanding projects investigating the viability of other technologies, wind energy is expected to remain the lowest-cost source of renewable energy out to 2030, when it is projected to be cheaper than generation from fossil fuels<sup>6</sup>.

#### Solar

Solar energy is an important source of renewable energy for homes and businesses in the State and under the Small-scale Renewable Energy Scheme financial incentives are provided for the installation of solar products.

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<sup>4</sup> Bureau of Resource and Energy Economics (BREE) (2012). *Energy in Australia 2012*

<sup>5</sup> Climate Change Authority (CCA) (2012). *Renewable Energy Target Review*

<sup>6</sup> Bureau of Resource and Energy Economics (BREE) (2012). *Australian Energy Technology Assessment 2012*

ROAM Consulting were commissioned<sup>7</sup> by the State Government to examine the commercial viability of South Australia's solar resource compared with three other States looking at Marginal Loss Factors (MLFs) or losses associated with transporting electricity over distances to load centres in each region.

The study examined generation and revenue forecasts for a number of solar technologies in different locations. The site selected for investigation in South Australia was Olympic Dam. The study showed that the Olympic Dam site was the most attractive site of all Australian sites under consideration in terms of investment. This conclusion was based on the assumption at the time that the Olympic Dam expansion would proceed, however the recent news that this project has been placed on hold by BHP means potential development of a solar farm at this site would be significantly less attractive.

Notwithstanding any of the above, the ROAM Consulting study also showed that the return on investment for utility-scale solar plants at these locations was significantly less than what can be delivered by wind farms, meaning that energy generated from these sources will be more costly to consumers.

### Geothermal

Geothermal energy is an emerging industry in Australia, and South Australia has significant potential to generate electricity from geothermal sources. Geothermal energy has already been utilised commercially at two Australian locations, namely at Birdsville where geothermal electricity is generated from the hot water from the great Artesian Basin, and at Portland where a geothermal district heating scheme has been supplied by the hot water of the Otway Basin for the last twenty years.

While this source of renewable electricity generation could provide baseload power in the long-term, the geothermal industry will require significant further development. To date only a single 1 MW generator has been commissioned in Australia, by geothermal exploration company Geodynamics.

There are two key projects being investigated in South Australia:

- Cooper Basin Project – 25 MW demonstration project to show the potential of hot-rock geothermal energy for zero-emission, base-load power being developed by Geodynamics.
- Paralana – the 7.5 MW project being developed by Petratherm and Beach Energy in the northern Flinders Ranges is an enhanced geothermal system project.

### Biomass

A biomass plant of up to 20 MW is being investigated as a potential future development in association with the Ceres Wind Farm Project. It would connect to the Project's converter station and enable excess straw from the agricultural practices in the area to be used to generate power on a full time (or baseload) basis.

### Wave

Wave energy is a relatively new form of energy generation which converts the kinetic energy of a wave into electricity.

A pilot plant is currently in operation approximately 1 km off the coast of Elliston on the Eyre Peninsula. Launched in 2012, the plant's first year of operation has been committed to the collation of operational data. It is estimated that the plant should be able to produce 1 MW of electricity, or enough electricity to supply approximately 500 to 700 homes.

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<sup>7</sup> ROAM Consulting (2010). *Solar Power Station MLFs*

## Summary

While there are a number of renewable energy options being investigated in South Australia that will help the state meet its renewable energy targets, these projects are not viable in the short term and would not be viable on the Yorke Peninsula, largely due to availability of each energy source and high capital costs of alternative technologies. The Project was initiated by local farmers in 2004 based on the area's wind energy potential and is considered to be a viable source of electricity for the region.

## 2.3 Turbine technology

### *Summary of submissions*

Some submissions received have questioned the efficacy and efficiency of energy generated from wind turbines.

### *Response*

Technological improvements in wind turbine design have increased the efficiency of power generation from wind farms. The turbines proposed to be used for the Project will use the latest generation design, incorporating larger, lighter, stronger rotor blades capable of withstanding high wind while minimising the physical loads applied to the turbine's nacelle. Improvements to turbine control systems also allow variable blade pitching and rotor speed, which means that newer turbine designs can exploit optimum rotor aerodynamics at any point within the turbine's operational wind speed range.

A variable speed wind generator is capable of adjusting the speed of the turbine's rotor within a notional range of  $\pm 40$  per cent of synchronous speed. Essentially these technological advancements allow the turbines to provide a uniform power export with minimal fluctuations.

Threat of lightning strike is mitigated through the incorporation of receptors built into the rotor blades. These receptors provide a point of attraction for lightning strikes, in the event of a lightning strike the lightning protection system discharges the energy from the rotor to the tower which is earthed via the foundations or a deep earth electrode.

## 2.4 Site selection

### 2.4.1 Site layout

#### 2.4.1.1 Proximity to highways

### *Summary of submissions*

A number of submissions voiced concerns that the wind farm was located too close to the highway and that this could adversely affect drivers as a result of visual and strobe effects from the turbines.

### *Response*

The draft *National Wind Farm Development Guidelines* (the draft National Guidelines)<sup>8</sup> address shadow flicker and the potential for distraction of vehicle drivers and state that there is a negligible risk associated with distraction of vehicle drivers who experience shadow flicker. This issue is discussed in more detail in Section 2.5.7 of this report.

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<sup>8</sup> Environment Protection Heritage Council (EPHC) (2010). *draft National Wind Farm Development Guidelines*, July 2010.

## 2.4.2 Setbacks

### *Summary of submissions*

A number of submissions raised the issue of setbacks and the different setbacks applicable to wind farm developments in other states.

### *Response*

The South Australian Statewide Wind Farms Development Plan Amendment (DPA) was approved in October 2012 and amended Development Plans across the State to include the provision of a setback of at least 2 km from defined and zoned townships, settlements or urban areas, as well as a 1 km separation distance between residences and the nearest turbine (unless a lesser distance is negotiated between developer and participating landowner). The key aim of these setback provisions was to manage visual impacts from wind farm developments.

The Project complies with the Yorke Peninsula Development Plan's requirements for a 2 km setback from townships and settlements and also complies with the Development Plan's 1 km setback from non-involved residences. The Proponent has incorporated a self-imposed minimum setback distance of 1.3 km from such residences into the Project design.

### 2.4.2.1 Proximity to non-participating landowners boundaries

#### *Summary of submissions*

A number of submissions raised concerns that turbines located on the boundaries of participating landowner properties could result in inequity for non-participating landowners, as well as impact on the ability of non-participating landowners to undertake aerial spraying.

#### *Response*

The Proponent adopted a self-imposed setback of 1,300 m from the residences of non-involved landowners and a minimum turbine spacing of 600 m as part of the design criteria for the wind farm layout to minimise impacts to adjoining properties.

In relation to aerial spraying and the potential impacts of the wind farm on non-participating landowner properties, it is noted that existing farming practices on the Yorke Peninsula are dominated by ground application of spray and less than 20 per cent of chemical and fertiliser application is currently undertaken by fixed wing aircraft.

The Aerial Spraying Report determined that the worst case impact of the wind farm was that all but 15 per cent of the area of adjacent allotments would be able to be sprayed from light planes, and even then that 15% was still capable of being sprayed from the air by helicopters while the adjacent turbines were in operation. More simply expressed, the wind farm would limit existing use of fixed wing aircraft over less than 3% of adjacent properties, and that 3% could still be sprayed from the air using alternative methods.

More detail regarding the mitigation of aerial spraying impacts is set out in Section 2.6.4.2 of this Response Document.

In particular, it should be noted that the Proponent has entered into a binding agreement with Aerotech Australasia (sole provider of aerial agricultural services on the Yorke Peninsula) that ensures that the wind farm will have no impact on aerial spraying on adjacent allotments. The agreement, which will bind future operators of the wind farm and the aerial spraying business, sets out arrangements for periods when aerial spraying is to be conducted, during which turbines adjacent to the flight path will be shut down with their blades rotated to be parallel with the flight path. The agreement also requires the shutdown of any additional

turbines in proximity to the spraying area in the event that turbulence is a risk to the safe and efficient conduct of the aerial spraying operations.

It should also be noted that the Statewide Wind Farms DPA amended Development Plans across the State to insert a consistent strategic planning framework for the assessment and approval of wind farm projects in South Australia. The Statewide Wind Farms provisions provide clear guidance on setbacks from the residences of non-participating landowners and from areas zoned for sensitive uses and the project design has been structured to comply with these provisions.

Other relevant guidelines designed to ensure that wind farms do not unreasonably impact on the amenity of their surroundings include the SA EPA's Wind Farm Environmental Noise Guidelines, which provide for separation from residential receivers, shadow flicker guidelines, which also relate to impacts on residential receivers, and aviation use setbacks which relate to airstrips and airports.

Neither the Yorke Peninsula Development Plan, the draft National Guidelines nor any other relevant statutory policies include any requirements as to setbacks from the boundaries of non-involved neighbouring properties, where the land on the boundary is not being put to a sensitive use.

Given that the Project complies with all relevant guidelines relating to protection of local amenity, and given the work done by the Proponent to ensure that the wind farm will not affect the productive capacity of adjacent land, it is reasonable to conclude that the Project satisfactorily minimises potential impacts on neighbouring properties and will not give rise to inequities between participating and non-participating land owners.

### 2.4.3 Alternative locations

#### *Summary of submissions*

A number of submissions questioned the rationale for Yorke Peninsula being selected as the preferred location for the Project and queried whether alternative locations, for example the Mid North region, would have been more appropriate.

#### *Response*

There are currently 7 wind farms in operation in the Mid North region, as well as a number in the planning or approval phase. While the Mid North area is highly suitable for wind farm development, it is not the only region in South Australia considered appropriate for wind farm development.

Importantly the Project area has previously been under examination by two other developers because the wind regime (resource) is known to be very suitable for wind farm development. One of these developers obtained development approval from the District Council of Yorke Peninsula for a wind farm project. Neither of these projects however, was able to achieve an economic connection to the electricity market, a challenge which the Ceres Project has now met in an environmentally and aesthetically sensitive way through the use of undersea and underground cabling through to Adelaide.

The Project was originally conceived in 2004 by local farmers who recognised the opportunities presented by the area's tremendous wind resource.

The Proponent completed an extensive assessment of the Yorke Peninsula region and its suitability as a site for wind farm operation. The investigation took into consideration a range of factors including wind resource, connection options, logistics and the capability of the community to support the Project. The cleared, freehold land is sparsely settled and farmed extensively. The Proponent also considered more than seven years of wind data collected and correlated across all four clusters, which showed the area to be highly suitable for wind farm development. The location of the Project will enable wind to be captured from both sides of the

Yorke Peninsula and enjoy a mean average wind speed in excess of 8.0 m/sec, which is considered suitable for a wind farm development.

## 2.5 Environmental issues

### 2.5.1 Noise

#### 2.5.1.1 Night time noise levels

##### *Summary of submissions*

Several submissions queried the potential noise impacts of the wind farm at night.

##### *Response*

For the purpose of the Noise Assessment undertaken for the Project, the SA EPA Wind Farms Environmental Noise Guidelines (the EPA Guidelines) set a noise limit for noise from the wind farm, which is the greater of either 35 db(A) or 40 dB(A) depending on zoning or the measured background noise level plus 5 dB(A), applicable at all residential dwellings in the vicinity of the proposed wind farm. The noise limit applies to noise from the wind farm both during the day and at night.

Background noise monitoring was undertaken at 29 properties, including 7 relevant receivers. Predicted noise levels from the proposed wind farm comply with the applicable noise limits as set out in the EPA Guidelines at the 7 assessed relevant receivers. Furthermore, wind farm noise levels have been predicted to be below the relevant minimum baseline noise criterion (either 35 db(A) or 40 dB(A) depending on zoning) at all non-participating landowner properties.

Wind farm noise levels at all remaining properties in the vicinity of the wind farm have been predicted to be below the applicable base criterion at all wind speeds and therefore comply with the lowest possible noise limits as set out in the EPA Guidelines.

Contours showing predicted noise levels in the vicinity of the Project are shown in the updated Noise Impact Assessment (refer Appendix A). The Project's compliance with EPA Guidelines is expected to mitigate potential night-time noise impacts to nearby residents.

#### 2.5.1.2 Infrasound and low frequency noise

##### *Summary of submissions*

A number of submissions raised concern in relation to the perceived noise impacts associated with the wind farm development, particularly infrasound and low frequency noise.

##### *Response*

Infrasound is the sound produced by most activities that occur in the rural and urban environment that lie in the frequency range generally considered to be below the perception of the human ear. Infrasound is generally defined as sound that is lower than 16 Hertz (Hz), which is considered to be the threshold of human hearing.

Infrasound emissions from wind turbines are not audible to humans and are significantly lower than natural levels of infrasound recorded near oceans, waterfalls and in forests, in addition to those measured in urban environments. A study undertaken in Australia by independent noise consultant Sonus<sup>9</sup> reported measured

<sup>9</sup> Sonus Pty Ltd (SONUS) (2010) *Infrasound measurements from wind farms and other sources*

levels of infrasound from two operating wind farms as well as a variety of other sources. The study concluded that:

*“Wind turbines generate infrasound, however, measurements made both outside and inside and at a variety of distances significantly less than separation distances between wind farms and dwellings, indicate the infrasound produced by wind turbines is well below established guideline perception thresholds.”*

*“This Australian study therefore reinforces several international studies by government organisations that infrasound emissions from wind farms are well below the hearing threshold and are therefore not detectable to humans.”*

*“... waves on a beach and motor vehicles, have been found to generate infrasound of a similar order to that measured in close proximity to wind farms.”*

*“The level of infrasound that has been measured in both a rural coastal and an urban environment is of the same order as that measured within 100 m of a wind turbine.”*

As a result of strict noise standards in Australia relating to audible sound, the distance between a modern wind turbine and a residence will always be considerably greater than 100 m. The Proponent has elected to impose a minimum setback between proposed turbines and non-involved residences of 1.3 km.

Low frequency noise is generally defined as noise content in the frequency range between 20 and 200 Hz and is often described as a ‘rumble’. Research undertaken by the SA EPA in response to the issue of wind farms and low frequency noise<sup>10</sup> measured low frequency noise (LFN) data from two operating South Australian wind farms and compared it with LFN measurements from four rural and seven urban locations. This research also took measurements of LFN at wind farm locations both at times when turbines were operating and when they were shut down. This EPA study concluded that:

*“Overall, this study demonstrates that low frequency noise levels near wind farms are no greater than levels in urban areas or at comparable rural residences away from wind farms. Organised shutdowns of the wind farms also found that the contribution of the Bluff Wind Farm to low frequency noise levels at Location 8 was negligible, while there may have been a relatively small contribution of low frequency noise levels from the Clements Gap Wind Farm at frequencies of 100 Hz and above.”*

The proposed wind turbine layout for the Project has been modelled in accordance with the EPA's Wind Farms Environmental Noise Guidelines, which includes consideration of a range of factors including local topography, separation distance, the ambient environment and weather conditions, in the determination of predicted noise levels.

Given that the Proponent has elected to adopt a minimum separation distance of 1.3 km between proposed turbines and non-participating landowners, and the noise from the wind farm is predicted to comfortably comply with noise limits applicable for residential receivers, it is reasonable to conclude that the design of the Project is such that it will not give rise to adverse impacts associated with infrasound and low frequency noise.

### 2.5.1.3 Converter station noise assessment

#### *Summary of submissions*

A number of submissions raised the potential noise impacts associated with the operations compound and converter station site(s). The potential noise impacts were considered more significant at the Port Julia

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<sup>10</sup> Environmental Protection Authority (EPA) (2013). *Low frequency noise near wind farms and in other environments*, April 2013

location given the rural nature of the site and existing background noise levels than the eastern converter station location at Parafield Gardens West.

### *Response*

The noise modelling in the original Noise Impact Assessment for the Project assumed no noise attenuation within and around the converter stations, giving what could be considered an idea of the 'raw' noise levels that would be generated.

Noise from each of the converter stations will be mitigated to ensure compliance with EPA noise criteria. The exact nature and combination of measures to be utilised will be determined during detailed design.

A number of mitigation measures have been recommended for consideration during the detailed design phase and include:

- equipment selection
- acoustic construction materials and construction methods
- orientation with regard to receivers
- physical noise barriers.

The Proponent has committed to demonstrating compliance of both converter stations with relevant EPA noise criteria and proposes that this be stipulated as a condition of approval.

## 2.5.1.4 Environment Protection Authority

### *Summary of submissions*

During the public exhibition period, requests for further information were received from the EPA on 12 February and 16 April 2013.

The February request for information related to the methodology used to undertake the noise assessment, issues relating to construction management and details of the proposed converter station at Parafield Gardens West.

The April request for further information identified a number of specific issues in relation to noise associated with the converter station.

### *Response*

A response was provided to the EPA on 22 February (regarding the 12 February request) and included the revised noise assessment for the Parafield Gardens converter station, as well as additional information to manage noise from the operation of the wind farm and the Port Julia converter station.

A response to the April request was provided on 23 July 2013.

A summary of the additional information provided is outlined below.

### *Operational noise criteria for Parafield Garden Converter Station*

#### *EPA submission*

The EPA advised that Operational Criteria for the proposed Parafield Garden Converter Station should be revised to reflect the methodology set out in the *Environment Protection (Noise) Policy 2007*.

## Response

Operational Criteria for the proposed Parafield Garden Converter Station have been revised in accordance with advice from the EPA, however it should be noted that receiver 8 is the Bolivar Sewerage Treatment Works and the special industrial land use category has been applied as defined in the Guidelines for the use of the *Environment Protection (Noise) Policy 2007*.

The revised noise criteria are detailed in Table 2.2.

**Table 2.2 Revised operational noise assessment goals for Parafield Garden Converter Station**

Receiver	Planning zone/Land use	Daytime noise criteria $L_{Aeq}$	Night time noise criteria $L_{Aeq}$
2	Rural zone/Agriculture	52	45
3	Residential/Residential	47	40
4	Rural living/Residential	45	38
5	Residential/Residential	47	40
6	Industrial/Light industry	57	50
7	Rural living/Residential	45	38
8	Special Industrial Land Use/Sewerage Treatment works	70	60

An overview of the assessment area and noise receivers was included as Figure 2.2 of the Noise and Vibration Assessment which was included as Appendix R to the Development Application.

A comparison of the predicted impacts with the revised criteria is included in Table 2.3.

**Table 2.3 Predicted operational noise levels (unmitigated) - Parafield Gardens West**

Receiver	Criteria Day/Night	Predicted noise level $L_{Aeq}$ dB(A) (Noise enhancing conditions)	Compliance with night time criteria dB(A) (Noise enhancing conditions <sup>A</sup> )
2 – Rural zone/Agriculture	52/45	54.5	no +9.5
3 – Residential/Residential	47/40	45.5	no +5.5
4 – Rural living/Residential	45/38	39	no +1
5 – Residential/Residential	47/40	46	no +6
6 – Industrial/Light industry	57/50	55.5	no +5.5
7 – Rural living/Residential	45/38	44.5	no +6.5
8 – Special Industrial Land Use/WWTP	70/60	40.5	yes – 19.5

Notes Values expressed as A weighted dB, to nearest 0.5 dB(A)

$L_{Aeq}$ = equivalent continuous (energy average) A-weighted sound pressure level

A – noise enhancing conditions included 2m/s wind speed towards the receiver and F class stability.

Comparison of the revised night time noise criteria with the predicted noise impacts during noise enhancing conditions (assuming no noise mitigation) indicated exceedances of up to 9.5 dB(A) at Receiver 2 directly north of the proposed converter station and 6.5 dB(A) at Receiver 7 to the south. Exceedances between

1 and 6 dB(A) were predicted for the receivers 3–6. Predicted noise impacts at Bolivar STP were below the adopted criteria.

A number of noise mitigation measures have been recommended for consideration during the detailed design phase in the Noise and Vibration Assessment based on the predicted exceedances. A combination of these noise mitigation methods will be utilised in the detailed design phase to ensure noise emissions do not result in exceedance of the criteria.

### Worst case scenario noise predictions

#### *EPA submission*

The EPA noted that the prediction of noise impacts must be detailed for 'worst case' scenario. If CONCAWE prediction algorithm is utilised, noise levels must be predicted for environmental conditions Category 6.

#### *Response*

The methods adopted in the assessment are discussed in Section 6.1 of the Noise and Vibration Assessment. Noise modelling was undertaken utilising Soundplan modelling software. Neutral and noise enhancing meteorological conditions were applied. The noise enhancing conditions were modelled by applying the CONCAWE calculation algorithm and included 2 m/s wind speed towards the receiver and very stable F class stability. These conditions represent worse case noise enhancing conditions and are equivalent to Category 6 environmental conditions.

### Construction noise

#### *EPA submission*

The EPA noted that construction noise criteria are only applicable at night time. Noise impact at day time must be managed in accordance with the General Environmental Duty. As such, alternative construction noise criterion must be based on the night time background data.

#### *Response*

Construction activities are proposed only for standard day time construction hours (7.00 am to 7.00 pm Monday to Saturday). As such construction activities will be managed in accordance with the General Environmental Duty. Mitigation measures for construction activities are detailed in the noise assessment report.

### Cable construction

#### *EPA submission*

The EPA noted that given the predicted noise from cable construction (up to 76 dB  $L_{Aeq}$ ), cable construction must not be undertaken at night unless this noise level can be reduced to 45 dB  $L_{Aeq}$  or there are no receivers nearby where noise exceeds 45 dB  $L_{Aeq}$ . Also noise from the operations compound might exceed applicable limits. The assessment must therefore detail practicable measures to meet the specified noise limits at the noise affected locations if necessary.

#### *Response*

Construction activities will only be undertaken during standard day time construction hours and a number of mitigation measures will be investigated during the detailed design phase to ensure noise impacts are below the criteria level.

Plant items, number and noise source sound power levels (SWL) listed in the Noise and Vibration Assessment and utilised in the Soundplan model are reproduced in Table 2.4. The adopted sound power levels are indicative A weighted levels that have not been confirmed at this preliminary stage.

**Table 2.4 Converter station operational sources**

Plant	Source SWL, LAeq	Number of plant
HVDC converter station	Individual 125 dB(A) internal SWLs modelled as external façade sources of 107 dB(A)	4 on external façades
HVDC smoothing reactor	90 dB(A)	6
AC filters	90 dB(A)	6
Cooling fans <sup>A</sup>	100 dB(A)	4 in series
Switching breakers	90 dB(A), includes a +5 dB(A) correction for potential impulsive noise	2 in series

Notes SWL = sound power level  
 LAeq= equivalent continuous (energy average) A-weighted sound pressure level  
 A – cooling fan sound power levels were reported as 90 dB(A) Table 6.2 of the Noise and Vibration Assessment, this should have read 100 dB(A).

Review of the source sound power levels and the model output files confirmed that predicted noise impacts were primarily influenced by the HDVC converter station façades and external cooling fans. Noise controls will be required to specifically target these sources.

Further modelling will be required at the detailed design stage using specific noise source spectra data and station layout to determine potential impacts and noise mitigation measures. It is expected that mitigation measures will include converter station façade attenuation, sound power level limits on key plant items, and noise barriers for key noise sources.

Building construction method examples are detailed in Table 2.5 for guidance on options for the converter station building design with the aim of further reducing noise breakout.

Cooling fan noise emissions will be dependent on ventilation power requirements and the relevant fan power ratings. Reductions in cooling fan noise emissions can be achieved with a combination of at source noise barriers and reduction of fan power rating.

**Table 2.5 Construction method**

Component	Construction	Sound transmission loss at 500 Hz (dB)
Walls	Single masonry brick	40
	Hebel 125 mm thickness	40
Walls/roof	Double skin consisting of trimdek and acoustic liner, 0.7 mm base metal thickness separated by 350 mm airspace 50 mm thick 48 kg/m <sup>3</sup> density insulation blanket sandwiched between skins.	47
Roof	Double skin steel roof with metal thickness of 0.8 mm separated by 200 mm air gap and 50 mm thick fibreglass insulation blanket	33
	100 mm concrete reinforced	45

Component	Construction	Sound transmission loss at 500 Hz (dB)
Doors	Hardwood 28 mm thickness	26
	Metal door with absorbent core and gaskets 100mm thickness	51
Ventilation louvers	Fantech sound bar louvers	
	SBL1	13
	SBL2	22

A combination of mitigation measures will be required to be investigated at the detailed design stage. With appropriate equipment selection and suitable placement and orientation of sources and intervening buildings and barriers operation of the converter station can be designed to achieve the noise criteria at the nearest receivers.

## 2.5.2 Flora and fauna

### Summary of submissions

A number of submissions raised the issue of flora and fauna and the proforma response highlighted the detrimental impact of the Project on flora and fauna.

### Response

#### 2.5.2.1 Buffers around native vegetation

The overall design philosophy for the Project was to minimise impacts to flora and fauna through the identification of no-go areas and the adoption of four different project buffers. These include 100 m buffers around high quality native vegetation, 100 m buffers around key bird and bat habitat, a 1 km buffer along the coastline and 500 m buffers around raptor nests.

A buffer of 100 m has been adopted by the Proponent as a suitable separation distance between native vegetation and turbine placement based on a precautionary approach and ecological expertise. While there is no legal obligation for the developer to provide a buffer from native vegetation and no existing wind industry standard describing recommended fixed separation distances from habitat, *avoidance* was identified during the development of the Project as the most appropriate means of managing potential impacts on birds and bats by providing an adequate buffer from key habitat.

The 100 m buffer between turbine placement and native vegetation is based on a precautionary approach in line with the draft National Guidelines which state:

*“The most appropriate means to manage for potential alienation effects on birds and bats is to site turbines with adequate buffer distances from focal habitat resources for key species. Focal resources will be features such as known or potential nesting microhabitats for raptors, wetlands or mudflats routinely used by aggregations of shorebirds, etc. Determination of what constitutes a suitable buffer distance is likely to be species-specific and dependent on individual characters of habitat and topography of the site. For some species that use particular and identifiable resources, such as breeding on wetlands with defined characteristics, home-range or territory mapping may provide an indication of the minimum zones that should be retained free of turbines and other infrastructure. A further radius will generally be required beyond the minimum home-range as a buffer from disturbance.*”

*Limited investigation of appropriate buffer distances from turbines has been undertaken in Europe, but empirical evidence for Australian species is not currently available. Wherever feasible and relevant, buffer distances between turbines and focal resources should be applied in design of the wind farm layout. For the present, determination of adequate buffer distances to reduce or eliminate disturbance and/or alienation for particular species should rely on expert opinion. Taking a precautionary approach, it will be better to err on the side of larger buffer distances based on such opinion. This approach is also likely to minimise risks of collision with turbines.”*

As such, there is no prescribed buffer distance for the Proponent to adopt for the Project. Based on the ecological assessments a buffer distance of 100 m has been adopted where practical in the project’s design. Notwithstanding this, based on expert advice from ecologists commissioned to quantify the potential impacts of the Project, a buffer of 60 m has been adopted in some instances to ensure a balance between minimising impacts on native vegetation and farming efficiency.

To accurately describe the condition and conservation significance of the remnant native vegetation in the project area, three classes have been used in vegetation mapping to manage potential ecological impacts associated with the Project. These are ‘Conservation’, ‘High Recovery Potential’ and ‘Highly Modified’.

To mitigate potential impacts to the ‘Conservation’ zones, a number of management measures have been identified, including:

- no placement of infrastructure within the area
- utilisation of buffers between infrastructure and the relevant zone
- re-vegetation and formal protection through the SA Heritage Agreement scheme.

No infrastructure has been placed within any of the ‘Conservation’ Zones and only 3 turbines are proposed near a ‘Conservation’ zone. These turbines have a 60 m buffer which the Project’s ecological team has advised is adequate for protecting the value and condition of these areas.

There are a number of landowners who are interested in revegetation works on their land and revegetation activities will focus on the protection and management of high value vegetation.

### 2.5.2.2 Converter station site selection and clearance requirements

The Proponent’s overall design philosophy has been to minimise impacts on native vegetation, primarily through avoidance strategies, while minimising negative impacts on the farming efficiency of paddocks (i.e. by not placing turbines in the middle of paddocks). While avoiding native vegetation was fundamental to the proposed design of the wind farm, some vegetation clearance will be necessary to facilitate construction, where avoidance cannot be utilised as a mitigation strategy.

The proposed site of the Yorke Peninsula converter station has been selected for a number of reasons, including its position near the coast of Port Julia and low productivity value as agricultural land. While converter station infrastructure has generally been sited on the western side of the proposed location (where vegetation is of lower quality) to minimise impacts to native flora, some clearance of native vegetation will need to be undertaken. Of the 18.5 ha estimated as potentially required for clearance, in excess of 8 ha has been rated as in ‘poor’ or ‘very poor’ condition, with the remainder rated as of ‘moderate’ condition. The majority of the vegetation proposed to be removed from the Yorke Peninsula converter station site consists of mixed grassland and open sedgeland.

The proposed clearance requirements for the operations compound adjacent to the converter station site are based on the largest footprint that may reasonably be required for this infrastructure and as such are based on the ‘worst case’ of potential impacts. The detailed design phase will minimise impacts to the vegetation on the converter station site and will site infrastructure in areas of lowest quality vegetation where possible.

A site Landscaping Plan will be developed as part of the detailed design phase for the operations compound. This Plan will protect existing roadside vegetation and include a framework for revegetation of sections of the site with similar species to provide visual screening of the facilities to be located on the site. The Proponent has committed to work with the District Council of Yorke Peninsula (the Council) in developing the landscape plan to ensure the environmental and planning objectives of the Council are met and proposes that this commitment be retained as a condition of any approval for the Project.

### 2.5.2.3 Native vegetation clearance

The overall design philosophy for the Project was to reduce native vegetation clearance in the Project area and recognise the importance of roadside vegetation. As a result of implementing avoidance as the main impact mitigation strategy, the proposed clearance of native vegetation has been limited to three locations along the cable route from the operations compound site to Port Julia.

The majority of vegetation to be cleared is located on the operations compound site and is considered by ecologists to be of low quality. Of the 18.5 ha just over 8 ha has been rated in very poor or poor condition with the remainder only rated in moderate condition with most of the vegetation proposed to be removed consisting of mixed grassland and open sedgeland. A copy of the maps showing vegetation type and condition of the converter station site are provided as Appendix C.

The proposed clearance requirements are based on the worst-case scenario. The detailed design phase will minimise impacts to the vegetation on site, as well as locating infrastructure in areas of lowest quality vegetation where possible.

Any native vegetation clearance will require approval from the Native Vegetation Council (NVC) under the *Native Vegetation Act 1991*. A significant environmental benefit (SEB) will be required to offset the clearance. A number of landowners involved in the Project have expressed interest in providing native vegetation offsets for the Project on their land holdings.

### 2.5.2.4 EPBC Referral

An EPBC Referral for the Project was lodged in November 2012 with the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). Based on the results of the environmental assessments, it was determined that the Project would not significantly impact upon any Matter of National Environmental Significance (MNES) provided that the mitigation strategies proposed by the Proponent to avoid potential impacts to MNES are implemented. The Project was accordingly determined to be *Not Controlled Action – Particular Manner* on the basis that a set of conditions were observed during the construction of the Project, including a number relating to the management of native vegetation as follows:

- that no clearance of *Acacia enterocarpa*, *Acacia rheticocarpa* or *Olearia pannosa* spp. *pannosa* occurs within the Project area
- that no more than 1.47 hectares of clearance of native vegetation located in road reserves occurs within the Project area
- that no clearance of native vegetation occurs in areas designated as conservation zones
- that a qualified ecologist is engaged prior to commencement of construction to undertake micro-siting surveys, assess vegetation buffers and advise on recovery potential and practices to be employed at the site
- weed control measures are implemented across the Project area
- temporary fencing be erected to delineate conservation zones and other ecologically sensitive areas
- that the use of vehicles, machinery and equipment is limited to the construction footprint, access tracks and existing cleared areas
- that construction staff and contractor induction is undertaken prior to commencement of construction activities in order to promote understanding and implementation of measures to mitigate impacts to MNES.

All of these conditions outlined above will be complied with to ensure that further EPBC assessment and approval is not required.

### 2.5.2.5 Mangroves at St Kilda

The cable at the land/sea interface at St Kilda has been designed to avoid the coastal zone that consists of high value mangrove and samphire habitat.

A report commissioned by the Coast Protection Board (CPB) in 2004 to establish a baseline and understand the condition of seagrass and mangrove communities in Outer Harbor identified dieback and decline in mangrove communities in the St Kilda area based on aerial photography over the last 40 years. Sea level rise and the inability of mangroves to retreat due to coastal development were the key factors associated with their decline (Natural Resources Services Pty Ltd, 2004).

A Construction and Environmental Management Framework for the cable has been developed to manage potential impacts and identify specific management measures during the installation of the cable (refer Section 2.5.11.1). The framework includes a flora and fauna management framework for drilling activity at the land/sea interface to protect the values of the samphire and mangrove communities at St Kilda. The Proponent met with the Coast Protection Board (CPB) in June 2013 to outline the framework and seek feedback on the proposed construction methodology. The Proponent has also consulted extensively with the EPA on the process for selection of an optimised final HVDC cable route that minimises impacts to sensitive marine environments. This process will involve further consultation with the EPA during finalisation of the cable route. Investigative marine and geotechnical surveys will be undertaken prior to finalisation of the route to identify the extent of HDD required to reasonably minimise impact to flora at the St Kilda coastal interface, with consideration of the balance of potential impacts to other environmental features.

The formal response from the CPB requested that a condition be imposed on any approval for the Project requiring the Proponent to liaise with marine and coastal officers to ensure that sensitive coastal and nearshore marine habitats are not impacted during cable construction. A condition of this nature would be acceptable to the Proponent.

### 2.5.3 Fire

#### *Summary of submissions*

A number of submissions raised the concern that wind farms create an increased risk of fire and in particular increase the potential risk of fire from lightning strikes.

#### *Response*

Modern turbines are equipped with automatic pitch controls for each blade. Pitch controls automatically rotate the angle of turbine blades out of an oncoming high speed wind, preventing the blades from overloading and the drive train components from overspeeding or overheating. Yaw controls fulfil a similar role in regulating the orientation of the turbine's nacelle. Pitch and yaw actuators connected to the turbine control system will automatically shut down any turbine close to functioning outside design conditions. The pitch and yaw controls are powered by failsafe mechanisms to ensure they operate in the event of a power outage. These safety systems mitigate the risk of turbine fires occurring as a result of overspeeding and overheating.

The threat of fire or damage to infrastructure from lightning strike is mitigated through the incorporation of specially designed conductors built into the rotor blades. These conductors provide an earth path for lightning strikes, so that in the event of a lightning strike the lightning protection system channels the electrical energy from the rotor to the tower and then to the ground via the turbine foundations or a deep earth electrode.

At the time of writing this document, there were more than 1,345<sup>11</sup> utility scale wind turbines operating in Australia. Based on research undertaken by the Australian Institute, in almost 20 years of wind farm operation in Australia there have only been four fires recorded and in all cases the fire did not spread beyond the relevant turbine. According to analysis undertaken by GL-Garrad Hassan<sup>12</sup> in 2010 of the occurrence of wind turbine fires between 2000 and 2009, the average likelihood of WTG fire occurrence across all wind turbines installed worldwide for the 10 year period was approximately 1 wind turbine fire every 11,500 years of operation. With the introduction of more advanced control and operational safety systems in modern wind turbines, it is anticipated that the probability of fire occurring at a wind farm using the latest technology is considerably lower than suggested by this statistic.

The risk of the occurrence of fire at wind farms or the risk of fire damage to turbines is considered low due to:

- turbine placement in generally cleared areas and the use of few flammable materials
- the absence of vegetation at the base of turbines
- the height of turbine above the ground
- the reticulation network being predominantly beneath the ground surface
- lightning protection systems incorporated into turbine design and installed on all turbines
- establishment of new access tracks which provide improved access for fire fighting and act as fire breaks
- electrical components being insulated and grounded
- monitoring systems installed in turbines that detect temperature increases and automatically shut the turbine down if the temperature exceeds the assigned threshold.

The fire risk associated with wind farms is considered minimal provided the wind farm is properly constructed and managed. The Proponent will develop an Operational Management Plan for the wind farm that manages the potential risk of fire, including appropriate fire breaks, monitoring of turbine temperature, employee training and inductions, emergency response procedures and maintenance activities developed to minimise risks.

Once fully developed, the wind farm will provide fire fighting resources in the form of:

- water tanks at the operations compound and the 8 cable junction sheds with quick coupling connections suitable for CFS access
- access tracks to all turbine locations which will be maintained for use by fire fighting vehicles
- dedicated fire fighting equipment and radio communications on all maintenance vehicles servicing the wind farm
- up to 50 wind farm maintenance staff trained in fire fighting techniques.

## 2.5.4 Aviation impacts

### *Summary of submissions*

A number of submissions highlighted concerns relating to potential impacts of the Project on the general use of aviation in the vicinity of the Project area, as well as specific impacts to the ability to undertake aerial fire fighting and aerial agricultural application. In particular, a number of submissions suggested that the fire fighting capability of emergency services teams in the region would unacceptably decrease due to the presence of the wind farm, on grounds that the proposed wind turbines would limit the ability for aerial fire fighting.

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<sup>11</sup> Clean Energy Council (2013). *Wind Energy*, retrieved from <http://www.cleanenergycouncil.org.au/technologies/wind.html>

<sup>12</sup> White G (2010). *Planning Panels Victoria Proponent: Stockyard Hill Wind Farm Pty Ltd, Expert Witness Statement of Graham White, 23 March 2010.*

## Response

The potential impacts to general aviation and aerial fire fighting are discussed in the following sections and aerial agricultural application is discussed in Section 2.6.4.2.

### 2.5.4.1 General aviation

The Proponent has prepared an assessment of potential impacts to general aviation that may result from the Project, *Proposed Ceres Wind Farm, Aeronautical Impact Assessment, Qualitative Risk Assessment and Obstacle Lighting Review* (the Aeronautical Assessment). The Aeronautical Assessment report was attached to the Development Application as Appendix I.

The Aeronautical Assessment determined that the Project would not require Obstacle Lighting and because regulations governing aviation (other than authorised low flying operations) in the area require that pilots fly at a height in excess of the maximum height of the Project, and general aviation would not be adversely affected. The Aeronautical Assessment further concluded, in the evaluation of a raft of risk areas considered for aviation that:

*“With regard to all categories assessed, it is considered that the proposed development poses an overall low level of risk that is considered to be of no operation significance and not a hazard to aircraft safety.”*

### 2.5.4.2 Aerial fire fighting

Based on the Aerial Spraying Assessment, which included a Qualitative Risk Analysis and fire fighting as a consideration, the wind farm will not negatively impact on aerial fire fighting operations.

From a fire prevention and management perspective, the Yorke Peninsula region due to its undulating terrain and a covering of fine bushfire fuels is rated by the CFS as an area of low to medium risk. The CFS response to the development application lists a number of specifications to which the access roads must be built. The Proponent is comfortable for such specifications to be included as a condition of approval.

Based on advice from the CFS and material published by the CFS, including the *CFS Fact Sheet- Understanding Aerial Fire-fighting*, wind farms are not considered to constitute a unique hazard when it comes to fighting fire from the air, and would be treated as any other potential obstacle at height such as power lines, radio masts or television towers. Furthermore, according to the *CFS Fact Sheet*, a copy of which is attached to this Response Document as Appendix D, aerial fire fighting is only used on a relative minority of fires throughout the fire season:

*‘The popular perception amongst much of the community is that aircraft alone can put out bushfires. This is not true. CFS firefighters and fire appliances for the vast majority of instances are the primary and only method of controlling bushfires.’*

Fire fighting aircraft operate under ‘visual flight rules’ which means they only operate in areas where there is no smoke and during daylight hours. The spacing of 600 m between turbines and 1.3 km clearance from non-involved landowners allows aircraft to operate around the wind farm given appropriate weather, visibility and terrain conditions. Importantly, in the event of a fire the wind turbines would be turned off to not only protect the turbines but also to reduce risks for aerial activities.

During the preparation of the Qualitative Risk Analysis discussions were held with the CFS which concluded that should a fire occur in the project area:

*‘The entire area is likely to be subject to heavy smoke ahead of the fire and may not be able to be dealt with by aircraft regardless of obstacles’.*

While smoke may limit the efficacy of aerial fire fighting whether or not the proposed wind turbines are present, it is clear that the construction of the wind farm, which will involve the upgrade of and construction of new associated access roads, will enhance the ability for CFS firefighters to respond to an emergency using ground based methods of fire fighting.

## 2.5.5 Blade throw

### *Summary of submissions*

Submissions received by the DAC have also suggested that wind turbine blades are susceptible to structural failure that could result in 'blade throw'.

### *Response*

The probability of 'blade throw' from a turbine is extremely small. The Proponent recognises the importance of structural integrity in the design and fabrication of project components and has made a commitment that turbines proposed for the Project must use blades that have been subjected to fatigue testing and comply with IEC61400-23, or an equivalent standard such as 2-dimensional blade testing as audited by a third party.

Incidents of blade throw are most often linked with blade failure resulting from lightning strike. Damage, fatigue and fire resulting from lightning strike have been associated with events of blade failure which have resulted in blade throw.

These very rare events however are primarily associated with older generations of turbines. New technology turbines, such as the REpower turbines proposed to be used by the Proponent, are equipped with lightning receptors in the blade tips which are designed to attract lightning and channel any strikes through the turbine and tower to discharge safely to earth. Similarly, the nacelle of a modern turbine is equipped with fail-safe automated control systems that ensure continued safe operation of the gearbox and generator.

## 2.5.6 Visual

### *Summary of submissions*

A number of submissions raised the issue of visual amenity from the proposed development, particularly on the coastal settlements. The size and scale of the Project was identified as an issue from a visual impact perspective.

### *Response*

The overall design philosophy for the Project adopted a 'constraint-based' approach to ensure that proposed infrastructure was sited in such a way as to avoid sensitive areas, including adherence to buffers and setbacks where possible and compliance with all relevant offset distances. This is demonstrated by the Project's compliance with the Yorke Peninsula Council Development Plan which states that '*visual impacts of wind farms and ancillary development (such as substations, maintenance sheds, access roads and wind monitoring masts) should be managed through*' adherence to the setback criteria detailed in the Development Plan.

The vast majority of the land within the visual viewshed of the proposed wind farm is zoned for Primary Production where the desired character statement in the Yorke Peninsula Council Development Plan envisages the development of wind farms and ancillary infrastructure. It also acknowledges that in order to take advantage of the natural resources upon which they rely, wind farms will need to be located in areas of visual prominence, be visible from scenic routes and valuable scenic and environmental areas and located closer to roads than envisaged by generic setback policy. In view of this the visual management strategies taken into account in the design process have consisted of:

- low density of turbines with minimum spacing of 600 m between turbines
- undergrounding of all electrical connections both within the wind farm and connections to the grid
- avoidance of all sensitive areas
- compliance with all Development Plan setback provisions.

The main connection to the high voltage electricity grid will be via a HVDC marine cable across Gulf St Vincent. The use of this connection strategy has avoided the potential visual impacts resulting from approximately 60 km of local overhead 33 kV power lines and over 100 km of high voltage overhead power line infrastructure (including six heavy duty, 275 kV conductors mounted on large lattice towers) which would otherwise have been required to establish a connection back to the national power grid. It should also be noted that the number of turbines proposed is essential in order to support the commercial viability of the Project's HVDC connection.

A *Landscape and Visual Impact Assessment Report* was prepared for the Proponent during the development of the Project. A copy of the *Landscape and Visual Impact Assessment Report* was attached to the Development Application as Appendix F.

Since the *Landscape and Visual Impact Assessment Report* was prepared, the turbine layout in the vicinity of the Dipper was revised to remove turbine 221 and relocate a number of turbines to increase the separation distance from the Dipper Coastal Settlement Zone. Consequently, the following separation distances are proposed:

- Port Julia – the closest turbine is 2 km away and within 3 km of the town there are 13 turbines spread across an arc from the north north-west to the south south-west direction.
- Pine Point – the closest turbine is 6.5 km away in a westerly direction.
- Sheaoak Flat – the closest turbine is 2 km away and within 3 km there are 12 turbines spread across an arc from the north north-west to the south south-west direction.

A submission received from the State Heritage Branch of the Department of Environment, Water and Natural Resources (DEWNR) has indicated that it is not the view of the agency that the Project has an adverse visual impact on nearby settlements, stating that:

*'The proposed development is considered sufficiently distant from the Pine Point, Port Vincent and Curramulka sites to not diminish their respective visual contexts.'*

## 2.5.7 Shadow flicker and blade glint

### *Summary of submissions*

A number of submissions raised the issue of shadow flicker, blade glint and the potential for resulting safety issues associated with the proposed turbines given their proximity to the highway between Port Julia and Port Vincent.

The potential for shadow flicker from turbines to cause epileptic seizures was also raised.

### *Response*

#### 2.5.7.1 Shadow flicker

The draft *National Wind Farm Development Guidelines* describes shadow flicker as 'a strobing effect created by the turbine blade passing between the direct light of the sun and residences within the immediate vicinity of a [wind turbine]'.

A worst-case analysis of the potential for 314 receptor locations in the vicinity of the Project to be affected by shadow flicker was assessed in the *Ceres Project Shadow Flicker Assessment*. The Shadow Flicker Assessment report was attached to the Development Application as Appendix H.

The Shadow Flicker Assessment found that all locations assessed would comply with maximum exposure levels set out in both the *draft National Wind Farm Development Guidelines* and the *SA Draft Planning Bulletin – Wind Farms*, based on the project layout included in the Development Application. The methodology and standards for the assessment of potential shadow flicker impacts included in the draft National Guidelines are conservative and consistent with industry best practice around the world. Given the Project's compliance with relevant guidelines and the self-imposed 1.3 km setback between all non-stakeholder residences and proposed turbine locations, it is not considered that any additional mitigation strategies are required for management of potential shadow flicker impacts on residences.

Shadow flicker only occurs when certain climatic conditions occur at the same time as the sun is positioned in a certain way (at specific times of the day). Shadow flicker therefore occurs more frequently at residences within the immediate vicinity of the turbine due to the stationary nature of a residence.

The potential impact of shadow flicker on drivers is negligible as the vehicle is in motion and therefore not affected by the strobing effect of shadow flicker for any period of time which may cause distress.

This is reflected by the draft National Guidelines, which state that<sup>13</sup>:

*“There is negligible risk associated with distraction of vehicle drivers who experience shadow flicker for the following reasons:*

- *Shadow flicker is little different for a vehicle in motion than the effect of shadow from trees on the side of the road or high passing vehicles, neither of which represent a significant risk in terms of road transport.*
- *Despite analysing the available data there has been no reference to motor vehicle accidents as a result of shadow flicker or blade glint.”*

It is acknowledged however that until wind farms become widespread in Australia they represent a visual novelty that may cause distraction for some drivers. Given the large number of wind farms present in the mid north of South Australia, as well as the existing wind farm at Wattle Point, it is assumed that the proposed Ceres wind farm would be considered less of a novelty on the Yorke Peninsula.

In relation to links between wind farm shadow flicker and epileptic seizures, the draft National Guidelines state<sup>14</sup>:

*“There is a negligible risk of epileptic seizures being caused by conventional horizontal axis wind turbines, for the following reasons:*

- *Less than 0.5% of the population are subject to epilepsy at any one time, and of these, approximately 5% are susceptible to strobing light (Epilepsy Action Australia, 2009).*
- *Most commonly (96% of the time), those that are susceptible to strobe lighting are affected by frequencies in excess of 8 Hz and the remainder are affected by frequencies in excess of 2.5 Hz. Conventional horizontal axis wind turbines cause shadow flicker at frequencies of around 1 Hz or less.*

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<sup>13</sup> Environment Protection Heritage Council (EPHC) (2010). *draft National Wind Farm Development Guidelines*, July 2010, Page 149.

<sup>14</sup> *ibid* Page 149.

- *Alignment of three or more conventional horizontal axis wind turbines could cause shadow flicker frequencies in excess of 2.5 Hz however, this would require a particularly unlikely turbine configuration.*

*To summarise, the chance of conventional horizontal axis wind turbines causing an epileptic seizure for an individual experiencing shadow flicker is less than 1 in 10 million.”*

Based on the advice set out in the draft National Guidelines and the very low risk of shadow flicker being caused by turbines as modelled in the Shadow Flicker Assessment, it is considered that there is a negligible probability of an individual suffering an epileptic seizure as a result of the Project.

### 2.5.7.2 Blade glint

Blade glint is produced when the sun's light is reflected from the surface of wind turbine blades and has the potential to annoy people, including road users.

The risk of blade glint from modern wind turbines is considered to be very low. Modern wind turbine blades have a low-reflective coating designed to prevent blade glint. The turbines proposed for the Project use blades that have are painted in a low-reflective matt coating specifically selected to reduce blade glint.

## 2.5.8 Electromagnetic Interference

### *Summary of submissions*

Some of the submissions received in relation to the Project raised concerns about the potential for infrastructure associated with the Project to cause Electromagnetic Interference (EMI) that may disrupt the use of communications services, including radio and television reception and devices using Global Positioning System (GPS).

### *Response*

Analyses of potential impacts on point-to-point, point-to-multipoint, radio and television services based on data provided by the Australian Communication and Media Authority (ACMA) have been included as part of the *Ceres Project - Electromagnetic Interference Assessment*<sup>15</sup> (The EMI Assessment). The EMI Assessment report was attached to the Development Application as Appendix G.

Investigation of the potential for the Project to affect AM and FM radio broadcasting services in the EMI Assessment determined that there is a negligible likelihood that proposed infrastructure will affect reception of these services. Digital television reception is similarly not expected to be affected by the Project and in the unlikely event that digital reception is affected, mitigation measures such as the relocation or upgrading of antennae at receiver locations can and would be used to resolve potential impacts. The EMI Assessment has determined that the Project may have the potential to interfere with analogue television reception, however analogue television services are no longer provided in Australia and as a consequence no actual impacts to service will result from the Project.

The use of standard GPS services is not expected to be affected by the Project.

Differential GPS, which utilises ground-based FM transmitters in conjunction with GPS satellites to provide high precision geospatial data, may be subject to interference on the commercial FM band. The Proponent will ensure that the use of this service is not adversely affected by the Project and commits to a pre-construction survey of Differential GPS users in the vicinity of the Project in order to:

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<sup>15</sup> *Parsons Brinckerhoff (2012). Ceres Project –Electromagnetic Interference Assessment, December 2012*

- identify users of at risk of potential interference to Differential GPS services in the local area
- identify the quality of FM reception for Differential GPS in the area
- propose alternatives to remediate potential interference to Differential GPS services, including the installation or upgrade of local FM transmission networks used for these services.

Eight turbines proposed as part of the Project were found to encroach on the 2<sup>nd</sup> Fresnel zones as calculated to surround the path of a total of three point-to-point communication links, indicating that the Project may have the potential to interfere with these services. It is expected that any possible service interference may be mitigated through engagement with the Licensees of these links in conjunction with potential implementation of any of the following measures:

- micro-siting, relocation or removal of turbines
- replacement of existing radio communications service equipment with other less affected types
- relocation of radio communications services to new or other existing radio communications sites
- enhancement of radar filters
- substitution of radio communication with underground or overhead communications infrastructure.

The Proponent has committed to the employment of mitigation measures in conjunction with further consultation with affected point-to-point communications Licensees to ensure that existing services are not adversely affected by the Project.

The results of the EMI Assessment indicate that impacts on point-to-multipoint communications services are not expected to arise as a result of the Project.

Potential impacts to Airservices Australia (AsA) radar infrastructure, particularly Primary Surveillance Radar (PSR) and Monopulse Secondary Surveillance Radar (MSSR) have been investigated as part of the *Ceres Project – Aeronautical Impact Assessment*<sup>16</sup> (the Aeronautical Assessment). Consultation with AsA on potential impacts to operational PSR and MSSR indicated that the Project is unlikely to affect the use of these radar technologies. Potential interference from the Project on AsA radar, though unlikely, is expected to be easily mitigated through the implementation of signal filtering<sup>17</sup>.

## 2.5.9 Traffic

### *Summary of submissions*

Submissions received expressed concern about the potential for the local roads to be damaged by vehicles used during the construction of the Project and for traffic volumes associated with construction to cause unacceptable increases in the use of roads in the vicinity of the Project area.

### *Response*

The Proponent commissioned an assessment of potential transport impacts as a part of the Development Application, the *Ceres Project Traffic and Transport Assessment*<sup>18</sup> (the Traffic Assessment). The Traffic Assessment report was attached to the Development Application as Appendix J.

The proposed transport route for the Project would see equipment predominately brought to the site from Port Adelaide via Port Wakefield Road, Port Wakefield-Yorketown Road and Ardrossan-Minlaton Road. A number of over-dimensional vehicles loads used to transport items such as wind turbine blades will require Restricted Access Vehicle (RAV) permits to be issued by DPTI.

<sup>16</sup> *The Ambidji Group (2012). Proposed Ceres Wind Farm, Aeronautical Impact Assessment, Qualitative Risk Assessment and Obstacle Lighting Review, December 2012*

<sup>17</sup> *ibid*

<sup>18</sup> *Parsons Brinckerhoff (2012). Ceres Project –Traffic and Transport Assessment, December 2012*

As a part of the Traffic Assessment, the forecast increases in traffic volumes of various vehicle types (light and heavy vehicles) resulting from construction and operation of the Project have been modelled. Although some local roads will experience high relative increases in traffic volumes during the construction period this is largely because of the very low existing traffic volumes observed on some local roads. The level of service required for the transportation of equipment and materials to the Project area is able to be absorbed within the existing capability of the road network, and any peripheral impacts to the road network are proposed to be managed through a range of mitigation measures detailed in the Project's Traffic Management Plan.

In order to ensure that any impacts to the condition, safety and operability of the proposed transport route are minimised, the Proponent commits to:

- completing a detailed Traffic Management Plan in consultation with DPTI and DCYP prior to commencement of construction, in order to establish a clear framework for transport activities
- obtaining RAV permits for all over-dimensional loads as required by DPTI
- undertaking a pre-construction survey and assessment of roads comprising the proposed transport route in conjunction with DPTI
- undertaking, or assisting in the undertaking by DPTI, of the compilation of a detailed pre-construction engineering report to determine any specific upgrades required along the proposed transport route to accommodate Project-related component transport
- using escorts for all over-size or over-mass loads as required by DPTI
- confining over-dimensional deliveries to daylight hours outside school drop-off and pick-up times (8:00 am to 9:30 am and 2:30 pm to 4:00 pm) to prevent conflicts with these activities
- implementing strict protocols for traffic management around intersections in the vicinity of the Project area that will be used for turning purposes by over-dimensional vehicles
- regularly undertaking surveys of local roads used for construction in conjunction with representatives of DCYP and undertaking maintenance as necessary to ensure that serviceability is maintained
- formulating a communication program to inform members of the local community of scheduled traffic volumes in conjunction with a complaints management system to take on input from community members relating to transport issues; and
- re-instating local roads to, at a minimum, a condition equivalent to that surveyed prior to commencement of construction of the Project.

## 2.5.10 Heritage (Aboriginal and European)

### *Summary of submissions*

A number of submissions raised the issue of potential impacts of the Project to cultural heritage and historic values.

### *Response*

The Project is proposed to be constructed in an area with a landscape that has been heavily modified by vegetation clearing in order to maximise agricultural production. It is not anticipated that the Project will adversely affect any areas of cultural heritage significance.

A cultural heritage survey was undertaken in consultation with the relevant Aboriginal groups to identify potential sites of archaeological sensitivity associated with the construction of the wind farm and associated infrastructure. The cultural heritage survey report was attached to the Development Application as Appendix E.

Based on the outcomes of this survey, the Proponent will ensure that Aboriginal site monitors will be present during ground disturbing works at areas identified as high risk from a cultural heritage perspective. The turbine layout has avoided identified landforms such as creek banks and limestone outcrops where archaeological sensitivity is higher.

The Proponent will continue to work with the two Aboriginal groups to minimise potential impacts and protect areas of cultural heritage or sensitivity. A cultural heritage management plan will be developed by the Proponent to ensure sites and places of cultural heritage significance are protected.

In relation to historic values, a desktop assessment of European heritage within 5 km of the proposed wind farm was undertaken. The only site of heritage significance within the vicinity of the proposed development was the Port Julia jetty and cargo shed and the construction works associated with the cable in this locality are not expected to impact this site.

The submission from the State Heritage Branch of the Department of Environment, Water and Natural Resources (DEWNR) indicated that the Project will not have a direct physical impact on any State heritage sites within 5 km of the project area and was considered sufficiently distant from the state heritage sites located at Pine Point, Port Vincent and Curramulka to not diminish their respective visual contexts. The submission went on to state:

*'The proposed development covers a vast geographical landscape. Although its extent may visually impact at least some of the twenty State Heritage listed items identified, it is not anticipated on the information provided the proximity of infrastructure will diminish the heritage values or immediate context of any place.'*

## 2.5.11 Marine

### Summary of submissions

Some submissions stated concerns about the potential impacts of the Project on the marine environment due to the proposed HVDC marine cable.

### Response

The Proponent has completed a habitat mapping survey of the broad area proposed to site the Project's HVDC marine cable entitled *Marine Habitat Mapping Survey: Ceres Project Sub-Sea Cable Alignment*<sup>19</sup> (the Marine Habitat Survey). The Marine Habitat Survey report was attached to the Development Application as Appendix Q.

No species of conservation significance were sighted in the completion of the Marine Habitat Survey. The Marine Habitat Survey indicated that some impact to seagrass communities may result from placement of the HVDC cable, however these impacts are expected to be negligible in comparison to historic and continued impacts to seagrass communities in Gulf St Vincent resulting from discharge of poor quality water. The Marine Habitat Survey concludes that most affected species of seagrass will be able to quickly recover from any disturbance resulting from installation of the HVDC cable. Any other fragmentation impacts to seagrass communities are expected to be able to be managed through the use of transplantation to re-establish the coverage of marine flora. It is acknowledged that some benthic filter feeders such as razorfish, ascidians, sponges and other species may be affected by ploughing of the HVDC cable route, however these impacts will be very minor and are not considered significant in the context of species abundance in the marine environment.

In relation to marine flora, ploughing the cable into the seafloor will result in relatively minor and temporary damage to the seagrass communities along the cable route however the impact is considered minor in the context of seagrass loss in Gulf St Vincent.

In regards to marine fauna, installation of the cable and construction vibration is considered a low risk activity for adverse impacts to aquatic fauna. The Proponent will liaise with the EPA and DEWNR in micro-siting the final route of the HVDC cable to ensure that impacts to longer-living seagrass communities, the reef system

<sup>19</sup> Geo Oceans (2012). *Marine Habitat Mapping Survey: Ceres Project Sub-Sea Cable Alignment, August 2012*

on the Port Julia side of the Gulf of St Vincent and any other sensitive species and communities are minimised by the final alignment.

The Proponent also commits to undertake monitoring of the final HVDC cable route following completion of construction for at least one year to ensure that no turbidity impacts resulting from installation of the cable cause on-going impacts to marine seagrass communities. A Construction and Environmental Management Framework has been prepared to manage potential impacts associated with the construction of the cable and is discussed in Section 2.5.11.1.

The Coast Protection Board commissioned an assessment of the Section Bank in 2004 to establish a baseline and understand the condition of seagrass and mangrove communities in Outer Harbor. The report identified that seagrass distribution at the Section Bank was in decline and in line with the metropolitan coast that there was little seagrass within approximately 1 km of the shore. Dieback and decline was also identified in mangrove communities based on aerial photography over the last 40 years. Sea level rise and the inability of mangroves to retreat due to coastal development were the key factors associated with their decline.

A number of submissions also raised the issue of the electromagnetic field (EMF) generated by the HVDC cable and the impact this may have on the marine environment. The electric and magnetic fields produced by DC are static, as opposed to AC which oscillates. Static magnetic fields occur naturally, at greater strengths than that transmitted through typical HVDC cables, and dissipate rapidly with distance from the line.

### 2.5.11.1 Construction Environmental Management Framework

#### *Summary of submissions*

The EPA requested further information on the potential environmental impacts associated with the installation of the cable.

#### *Response*

Based on the EPA's request for further information, a Construction and Environmental Management Framework (CEMF) has been prepared to manage potential impacts during cable construction. The framework provides further detail on the proposed construction methodology and the impacts associated with jet trenching and ploughing along the cable alignment.

A Scope Construction and Environmental Management Plan (CEMP) was prepared as part of the Development Application for the Project. The Scope CEMP covers the land based components of the Project and the framework covers the marine component of the Project which includes the land/sea interface points at Port Julia and St Kilda where the land based issues may impact the marine environment. Copies of the Scope CEMP and CEMF are provided as Appendix B and Appendix E to this Response Document respectively.

The key objectives of the CEMF are to:

- provide a framework for the management of environmental impacts during construction of the marine cable
- address the statutory requirements for the Project
- identify the mitigation measures to be implemented to manage environmental impacts during construction
- address community and government concerns regarding potential environmental impacts
- outline the Proponent's environmental commitments to manage the perceived impacts.

The key potential construction issues identified for the cable are:

- drilling management
- vessel and other traffic management
- acid sulfate soils management
- trenching management.

The following environmental assets that may be impacted by construction activities are discussed in the CEMF:

- cultural heritage management
- noise and vibration management
- water quality management
- marine pest management
- stakeholder management.

The CEMF identifies a number of specific mitigation measures to mitigate potential impacts associated with construction. These include:

- utilisation of a combination of design and mitigation strategies in the selection of equipment and layout of the Converter Station facility to demonstrate compliance with the EPA's noise criteria at nearby receivers
- completion of soil surveys and geotechnical investigation of Gulf St Vincent in consultation with EPA in order to optimise the proposed HVDC cable route and wherever practicable avoid or mitigate potential impacts to the marine environment
- completion of detailed investigations to confirm the proposed HVDC construction methodology and final extent of HDD required
- developing an Acid Sulfate Soil Management Plan including an appropriate disposal method should acid sulfate soils be discovered and/or disturbed
- preparing an erosion/sediment control plan, including investigating the need for an evaporation/sediment pond at St Kilda and Port Julia
- developing a Vessel Code of Conduct
- developing a Marine Pest Risk Assessment and Monitoring Plan and a Marine Equipment Inspections Plan
- establishing a 500 m safety exclusion zone around the construction area
- preparing a Dredge Management Plan which includes specific mitigation measures for jet trenching and dredge ploughing works
- developing a Turbidity Monitoring Program that complies with water quality targets determined by EPA
- preparing a Traffic Management Plan in consultation with Councils and DPTI to manage land based traffic at Port Julia and St Kilda
- preparing a noise and vibration management plan.

### 2.5.11.2 Commercial fishing and aquaculture

#### *Summary of submissions*

The potential impact on commercial fishing and aquaculture was raised as an issue, in particular sedimentation impacts from trenching activities.

#### *Response*

The Construction and Environmental Management Framework (CEMF) includes an erosion and sediment management framework to minimise the suspension of sediments during trenching and ploughing activities. Once the extent and scope of dredging operations has been determined a Dredge Management Plan,

including sediment and turbidity controls, and a Turbidity Monitoring Program will be prepared in accordance with EPA legislative requirements.

A vessel management framework has been developed which includes the establishment of a 500 m safety exclusion zone around the construction area to ensure a separation distance is maintained for commercial vessels and the safe operation of marine activities.

Construction activity will not be undertaken between November and January if possible to minimise potential impacts to spawning Snapper in the northern part of Gulf St Vincent.

### Sediment generation

As part of the development application Water Technology undertook a coastal process and hydrodynamic assessment of the proposed HVDC cable. The assessment estimated that approximately 240 tonnes of suspended sediment would be generated in the vicinity of Barker Inlet by jet trenching activities. The estimated volume of suspended sediment was based on an assumption of 5% fines (particles smaller than 0.06 mm). The EPA questioned why this figure was adopted as well as the inconsistencies in the trencher advance rate (100 m/hr to 200 m/hr). Water Technology advised the following:

- Assumption of 5% fines

The sediment information available was based on sediment samples from a series of transects through Barker Inlet reported in the following paper:

Bone, Edwards, Deer, & Campbell (2010), *Sediment sizes and sources in the cool-water, coastal environment of Adelaide, South Australia*.

The paper showed the proportion of particles finer than 0.06 mm as only between 1–3% in Barker Inlet, so the 5% assumption is conservative. Particles greater than 0.06 mm are classed as sands and that sized particle does not stay in suspension for any significant length of time. The assumption that they would drop out almost instantaneously around the jet trencher is not considered unreasonable in this context.

- Trencher advance rate

There is a large range of estimates for the expected advance rate of jet trenchers. Depending on whether the rate is 100 m/hr to 200 m/hr the total trenching time is estimated at between 50 and 100 hours respectively in the vicinity of Barker Inlet.

### 2.5.11.3 Recreational fishing and boating

#### Summary of submissions

The impact on recreational fishing and boating was raised as a potential impact.

#### Response

Meetings with PIRSA were held during the exhibition period to outline the Project and discuss proposed construction methods. The preferred method for installation of the HVDC connection network is under the sea floor and should not impact on recreational fishing in the Gulf. Whilst the installation process may have temporary effects on the distances recreational boating vessels should keep from the barge during cable installation an exclusion zone will apply during the construction period.

Vessel management has been identified as one of the potential construction issues for the cable and the CEMF includes a vessel management framework to minimise impacts to marine recreational activities. The CEMF identifies a number of mitigation measures, including:

- establishing a 500 m safety exclusion zone around the construction area
- inductions for vessel operators
- developing and implementing communication protocols with recreational fishers to minimise disruption to recreational activities.

## 2.6 Economic issues

### 2.6.1 Tourism

#### *Summary of submissions*

A number of submissions raised concerns regarding the negative impact the wind farm would have on tourism in the region both in terms of visitor numbers and the attractiveness of the region as a place to visit.

#### *Response*

The nature of potential impacts of wind farm projects on tourism is uncertain and context specific. While some tourism agencies predict wind farms will damage tourism, some wind farms have become tourist attractions and many wind farms incorporate visitor facilities, such as observation decks, visitor information or tours.

The development of a wind farm can lead to a change in people's perception of a region and therefore the attractiveness of the region as a place to visit. There is an existing wind farm (Wattle Point) located to the south of the proposed development near Edithburgh. Whilst the introduction of another wind farm in the region may change people's perception of the Yorke Peninsula as a region which has wind farms, for many visitors who do not go further south than Port Julia or Sheoak Flat (also known as Sheoak Flat) there will be a change in perception but it will not be a cumulative change as the Ceres Project would be the only wind farm evident on their journey. For those travelling further south, the cumulative impact would be minimal as there is a break of approximately 20 km between wind farms.

Research shows that there is no evidence to support the assertion that wind farms are likely to have a negative impact on tourism. In fact, most studies predict that any negative impacts would be outweighed by the increased number of tourists attracted by a wind farm and the associated benefits tourism brings in terms of employment and expenditure.

### 2.6.2 Financial incentives for renewable energy projects

#### *Summary of submissions*

A number of submissions made the assertion that the Project would be subsidised by the Commonwealth Government through funds derived from taxes levied on individuals and businesses.

#### *Response*

No 'taxpayer subsidies' will be provided to the Project.

The objectives out of the Commonwealth's *Renewable Energy (Electricity) Act 2000* (the Act) are as follows:

- to encourage the additional generation of electricity from renewable sources*
- to reduce emissions of greenhouse gases in the electricity sector*
- to ensure that renewable energy sources are ecologically sustainable.*

*This is done through the issuing of certificates for the generation of electricity using eligible renewable energy sources and requiring certain purchasers (called liable entities) to surrender a specified number of certificates for the electricity that they acquire during a year<sup>20</sup>.*

As discussed in Section 2.2.1 of this document, utility scale renewable energy projects are incentivised by the LRET as set out in the Act and its associated Regulations. The Act requires that liable entities (generally wholesale purchasers of electricity) procure and surrender Large-scale Generation Certificates (LGCs) equivalent to a proportion of the total wholesale electricity bought from the National Energy Market (NEM) annually. Each LGC represents one Megawatt-hour (MWh) of electricity generated from a renewable source. Wind farm operators and other eligible generators of renewable energy are issued an LGC for each MWh they generate by the Australian Clean Energy Regulator. LGCs may then be purchased from eligible generators by liable entities in accordance with the Act. In turn, the costs of procuring the liable entity's LGC obligation are passed on to those that consume the electricity, the customers of each liable entity. In this way, the construction of renewable energy projects is incentivised by the Act by passing costs on to electricity consumers, roughly in proportion to their consumption of electricity. It has been estimated by the Australian Energy Market Commission that the costs to retail electricity consumers of meeting the LRET in the year 2013–2014 will comprise 1.8% of the average electricity bill<sup>21</sup>.

In conclusion, it is clear that taxpayer subsidies are not provided to renewable energy generators and that growth in renewable energy generation is incentivised by consumers of electricity by placing obligation on retailers operating in the NEM.

### 2.6.3 Employment and economic impacts

The Project is anticipated to generate approximately 500 direct jobs during peak construction and a further 50 Full Time Equivalent management, operation and maintenance jobs throughout its 25 year operational life.

A Senate Report into *The Social and Economic Impact of Rural Wind Farms*<sup>22</sup> received information from industry sources stating employment numbers for both the construction and operational phases of established wind farm developments.

The Committee formed the opinion that while there is an absence of data in relation to the calculation of net employment figures in the Australian wind industry, it was clear that the wind industry did generate employment, and will continue to generate 'significant levels of direct and indirect employment'.

Analysis of the economic impact of the Hallett wind farms in South Australia undertaken by Sinclair Knight Merz (SKM)<sup>23</sup> revealed that regional communities around the 4 Hallett wind farm projects benefited from an increase in regional employment and demand for local goods and services. SKM reported that 30% of the construction workforce for the Hallett wind farms was sourced from workers within the region. Assuming a similar proportion of local workers are employed in the construction of the Project, this will result in 150 construction jobs for residents of the Yorke Peninsula.

The wind farm construction workforce will also have the effect of stimulating the regional economy, with the SKM report showing a marked increase in revenue reported by hospitality and accommodation operators during the construction phase of the Hallett wind farms.

<sup>20</sup> Commonwealth of Australia (2000). *Renewable Energy (Electricity) Act 2000* retrieved from [http://www.austlii.edu.au/au/legis/cth/consol\\_act/rea2000283/](http://www.austlii.edu.au/au/legis/cth/consol_act/rea2000283/)

<sup>21</sup> Australian Energy Market Commission (AEMC) (2011). *Possible Future Retail Electricity Price Movements: 1 July 2011 to 30 June 2014*

<sup>22</sup> Commonwealth of Australia (2011). *The Social and Economic Impact of Rural Wind Farms/ The Senate, Community Affairs References Committee, June 2011*

<sup>23</sup> Sinclair, Knight and Merz (SKM) (2010) *Economic Impact Assessment of the Hallett Wind Farms. Report Prepared for AGL.*

Other business which reported increases in business activity during the wind farm construction included tradespeople, transport operators, quarries and concrete businesses. It is estimated by the report that more than 12% of the materials used in construction of the Hallett wind farms were sourced from the local region.

Wind farms provide on-going economic benefits for the duration of project life. According to the SKM report, 50% of the operational expenditure required to keep the Hallett wind farms running is spent directly in the region.

Major infrastructure projects have flow-on effects beyond the economic stimulus of the local economy in the region where they are constructed. Further work done by SKM on the economic benefits of wind in energy in Australia<sup>24</sup> demonstrates that wind farm projects stimulate employment in related sectors as described above. According to the report, more than two jobs are created in related sectors for each direct job created during construction. Based on figures published in this later SKM report, the Ceres Project (with a construction workforce of 500 direct employees) can be expected to create approximately 1600 direct and indirect jobs during construction at a local and regional level. Similarly, the Project is expected to support a direct and indirect workforce of approximately 120 during its operational phase.

Further to the immediate and indirect employment and economic benefits of the Project, it should also be noted that the Proponent is well progressed in discussions with Rex Minerals to provide electricity to the proposed Hillside Mine site and is looking to support the roll-out of the National Broadband Network in conjunction with the installation of the Project's HVDC connection. From the early design phase, the Project has been carefully structured wherever possible so as to support complimentary development in the region.

The Project will provide a significant opportunity for economic development at a local, regional and national level and will offer employment opportunities that will complement the operation of the agricultural sector on the Yorke Peninsula.

## 2.6.4 Agriculture

### *Summary of submissions*

The majority of submissions raised the loss of agricultural land and the ability for farmers to continue to undertake farming practices, in particular aerial agricultural application.

### *Response*

#### 2.6.4.1 Agricultural value of land and impact on farming practices

Wind farms are compatible with traditional farming activities and are not at conflict with continued farming on the Yorke Peninsula. Wind farms have minimal impact on land use due to their small footprint and the balance of landholdings surrounding the site can continue to be used for agricultural purposes.

Given the value of land and the scale of farming operations in the region, one of the highest objectives of the design of the Project was to minimise the impact of the Project on cropping.

The overall footprint of the wind farm (which is a combination of turbine footing area, hard stand areas near each turbine, and access roads, but which does not include the converter stations or operations compound) is less than 141 hectares. This is less than 1% of the 14,600 hectares of total arable land area hosting the wind farm. Within this 141 hectares, most of the access roads are proposed to be located in areas not used for cropping, such as against existing fence lines and following existing access tracks. Consequently the effective reduction in cropping land as a result of the Project would be significantly less than 141 hectares.

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<sup>24</sup> Sinclair, Knight and Merz (SKM) (2012) *Benefits of Wind Energy in Australia. Report Prepared for the Clean Energy Council.*

The operations compound/converter station site on Yorke Peninsula is an area of 18.5 hectares of which only around half will be used. Further, this site is not on arable land (i.e. it is on land deemed unsuitable for cropping).

The hosting of turbines provides diversification of income for host landowners and an increase in the net income of the farm business through turbine lease payments and ongoing job opportunities. This increased income provides opportunity for further investment in traditional farming to increase productivity and farming efficiencies. Wind turbines provide an alternative source of income that is not susceptible to drought, is low risk in terms of investment and provides a stable income for the 25 year life of the Project.

The Project will stimulate the Yorke Peninsula regional economy through increased demand for local goods and services and the generation of construction and operation and maintenance jobs.

The Project has been designed to minimise impacts to agricultural land use from the outset. The application of these principles included:

- the use of underground cabling rather than overhead transmission lines throughout the project's design
- a spacing of 600 m between turbines.

Furthermore, agreements with landowners have included a number of specific measures to minimise interference with production and impacts to the integrity of farming land during the construction phase of the Project.

A flora and fauna management plan will be developed for the site and will include specific measures to control the establishment and dispersal of weed and pest animal species on-site.

At the end of the 25 year life of the Project, the wind farm will be decommissioned by removal of all surface equipment and reinstatement of soil over turbine footings, and the land returned to its original state in accordance with the landowner agreements.

#### 2.6.4.2 Aerial spraying

Compatibility with aerial application was a central consideration in the design of the Project and informed the Proponent's decision not to use overhead transmission lines and to adopt a 600 m spacing between turbines to minimise impacts to farming practices.

As discussed in Section 1.2.1.1, the Ambidji Group Aerial Spraying Report was completed to assess the potential impacts to aerial agricultural activity as undertaken in the vicinity of the project area. An analysis of the potential efficiency impacts to aerial agricultural practice in the vicinity of the project area was completed in 2012 after commencing in 2011. As a part of this analysis, a request was made for submissions to the Proponent from potential affected stakeholders. This call for submissions was made in order to estimate the number of potentially affected parties and the nature of possible impacts.

Six submissions were received (including one from Aerotech) in January 2012 which informed the scope of the Aerial Spraying Report. Based on conservative assumptions and engagement with potential affected stakeholders, it was determined that:

- for 80% of the neighbouring properties involved in the assessment, the reduction in the land area able to be dressed using large aerial agricultural aircraft was less than 15% of the total land area comprising these properties; and
- for 90% of the neighbouring properties involved in the assessment, the reduction in the land area able to be dressed using small aerial agricultural aircraft was less than 10% of the total land area comprising these properties.

Existing farming practices on the Yorke Peninsula are dominated by ground application and it is estimated only 20 per cent of chemical and fertiliser applications are undertaken by aircraft<sup>25</sup>. The majority of aerial application work in the region is undertaken by Aerotech Agriculture, using the Arthurton Airstrip which is located 25 km north of the proposed wind farm northern boundary.

The assessment concluded that the total area potentially affected by loss of efficiency is 288 ha. As such, it is considered that the impact on agricultural aircraft application efficiencies is relatively small even before the implementation of further mitigation measures (primarily as a result of the design decision not to use overhead power lines). If helicopters were used for aerial spraying as an alternative to light planes, all adjoining properties would be capable of being sprayed from the air, with 3 per cent of that adjoining land being required to aerial spray via helicopter rather than fixed wing aircraft.

A key mitigation strategy inherent in the wind farm design was the placement of all electrical connections underground, avoiding the use of approximately 60 km of overhead power lines in and around the project area and enabling clear paths for access for agricultural aircraft. This is an unprecedented commitment for any existing or proposed wind farm in Australia.

It is estimated that the use of a further 100 km of high voltage power lines has been mitigated by the HVDC cable link to Adelaide across Gulf St Vincent.

The primary conclusion of the Ambidji Aerial Spraying Report is that the impact on agricultural aircraft is relatively small (3%) even before considering the implementation of further mitigation strategies. The report identifies a number of mitigation measures.

#### Ground based applications

The majority of chemical and broadcast application on the Yorke Peninsula involves low impact ground sprayers. Some farmers use aerial application for insecticide/pesticide, as well as fungicide and fertiliser during the late crop stage.

#### Potential use of helicopter applications

The use of helicopters to undertake aerial agricultural application is a potential mitigation measure that may be used to ameliorate impacts on properties where there are reductions in the application efficiency of fixed-wing aircraft. Helicopters are highly manoeuvrable and are able to undertake aerial applications with great precision in confined spaces.

While it is acknowledged that the use of helicopter operations are generally more expensive than the utilisation of fixed-wing aircraft, they enable faster application and administer a more targeted spray pattern with less spray drift (due to the down-force applied by rotor).

Farmers generally utilise helicopters for aerial agricultural applications in situations where they require:

- precision due to orientation of paddocks which contain obstacles such as trees, power lines, buildings and wind turbines
- more precise application due to irregularly shaped cropping areas
- decreased spray drift
- increased chemical penetration due to rotor down force and crop agitation.

The proponent is in an advanced stage of investigating the potential for introducing helicopter spraying within the wind farm. Discussions are well underway with experienced and accredited service provider – County Helicopters.

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<sup>25</sup> *The Ambidji Group (2013). The Ceres Wind Farm Project, Assessment of Agricultural Applications for Fixed Wing Aircraft*

### Potential direct compensation for adjacent farming properties

Following exhibition of the Project's Development Application, twelve submissions from occupiers of neighbouring properties (some of which referred to the same property) were lodged with the DAC, suggesting that they will be directly impacted by loss of aerial spraying capability. Some of these submissions sought direct compensation from the Proponent.

Given that aerial spraying services for adjacent properties will not be affected by the wind farm, direct compensation of landowners is not necessary.

The Proponent acknowledges that, if required, direct compensation could have been used to address potential reductions in aerial application efficiency.

Such a scheme could be structured as an annual payment to affected stakeholders based on agreed annual losses or a discrete compensation payment for each type of application event. It is assumed any compensation offered for the affected stakeholders would be based on a number of variables including the frequency and type of application event and the area subject to loss of application efficiency.

### Aerotech Australasia Agreement

In July 2013 the Proponent entered into a legally binding agreement with Aerotech Australasia to facilitate the continued provision of aerial agricultural services by Aerotech to adjacent properties without change to service, cost or quality.

The agreement prescribes an agreed set of communication and operation protocols between Aerotech and the Proponent, whereby turbines near the boundaries of adjacent non-involved landowner properties would be turned off and blades would remain stationary during aerial spraying. In addition, the turbine structure would be moved to ensure the turbine blades were aligned to be parallel to the flight path of the fixed wing aircraft. This would provide a clearance of at least 60 m and to further reduce risks, the wind turbines within 500 m of boundaries of non-involved landowner properties would also be turned off to eliminate any risk of turbulence.

The terms of the agreement provide a workable solution to any spraying and wind farm interface issues, given that when aerial spraying is appropriate to undertake, wind speeds are typically low in order to avoid spray drift. At the same time, when the wind speed is low, the wind farm is generally not operating so there is no loss of generating capacity if the communication and operation protocols are used to facilitate aerial spraying.

The Agreement in place between the Proponent and Aerotech Australasia (which will bind future owners and operators of the wind farm and Aerotech's aerial spraying business), together with the proposed mitigation measures implemented during wind farm design and identified in the aerial spraying report, demonstrate that the Proponent has made all efforts to avoid or minimise impacts on farming production as a result of the construction and operation of the Project. Whilst the initial aerial assessment indicated a 3 per cent reduction of aerial spraying capacity based on worst case scenario, the agreement will ensure that existing services continue unchanged.

This demonstrates that the Project is compatible with the existing farming practices and will have a negligible impact on the productive capacity of the farming activities in the zone within and adjacent to the wind farm.

In addition, to ensure that equivalent fixed wing aerial spraying services can continue to be provided to adjacent land owners for the life of the wind farm, the proponent undertakes that in the event that an aerial spraying service provider other than Aerotech proposes to undertake aerial spraying services on land adjacent to the wind farm, the Proponent will offer to enter into an interface agreement with that provider that provides, at a minimum, or as agreed with the provider, for the same communications and operation protocols as the Aerotech agreement, so that, where required during aerial spraying:

- turbines near the boundaries of relevant adjacent non-involved landowner properties will be turned off, and blades will remain stationary and aligned to be parallel to the flight path; and
- turbines within 500 m of boundaries of relevant non-involved landowner properties will be turned off where there is risk of turbulence from the turbines impacting on the spraying operations.

The Proponent agrees to this commitment being encapsulated as a condition of approval.

### 2.6.4.3 Impact on bees

#### *Summary of submissions*

Two submissions raised the issue of bees being used to increase agricultural yields to pollinate crops and the impact the wind turbines would have on bees as a result of noise, EMI, air pressure changes and turbulence caused by turbines.

#### *Response*

Whilst there is some evidence that wind turbines may have effects on bees, further studies would need to be undertaken to determine if turbines have a negative effect on bees. Bees are an introduced species from an ecological perspective despite their apparent benefits to agriculture.

It should be noted however that bees fly at canopy height and would therefore not interact with blades. Whilst they may fly high when dispersing to new areas, generally their movements are localised.

### 2.6.5 Mineral resources

#### *Summary of submissions*

DMITRE raised potential land use conflicts with mining exploration licences located on the Yorke Peninsula.

The basement rocks underlying the proposed project area have been shown to have significant potential for copper, gold and other metallic mineralisation and the area is considered to be highly prospective. DMITRE is concerned that both early stage exploration and particularly advanced exploration of target areas may be adversely impacted by the wind farm development. Under the *Mining Act 1971*, a wind farm operator has the status of a landowner, which will mean that an explorer wishing to undertake ground-based exploration activities around the wind farm will need to engage with and provide compensation to the wind farm operator if required.

#### *Response*

The Proponent consulted with the only two relevant and potentially affected parties holding exploration licences covering land coincident with the wind farm; Rex Minerals and Phoenix Copper.

The consultation with Rex Minerals has been significant and on-going since October of 2012 when a Memorandum of Understanding (MoU) for the supply of electricity was signed by Rex Minerals and the Proponent. Phoenix Copper was consulted in December 2012 prior to the lodgment of the Project's Development Application. In addition the Proponent consulted with both DMITRE and SACOME during September 2012 in order to ensure that mutual development may occur in the vicinity of the Project. The Proponent has consistently advised involved landowners to fully cooperate with any mineral explorer for land access and investigations. The Proponent will continue to consult with the mineral tenement holders in regards to potential impacts to current and future exploration licenses and/or mining leases within the proposed project area. The Proponent will investigate developing a Mining Management Plan between the affected parties to manage future access and exploration activities within the project area.

## 2.7 Effects on communities

### 2.7.1 Health concerns

#### *Summary of submissions*

A number of submissions raised concerns of potential health impacts resulting from wind farms. Concerns relating to adverse health impacts generally focus on the possibility for low frequency noise and infrasound to cause ill health and sleep deprivation.

#### *Response*

Australia's peak health and medical research and advisory group, the National Health and Medical Research Council (NHMRC), released a study<sup>26</sup> and public statement in July 2010 which stated that:

*"there is currently no published scientific evidence to positively link wind turbines with adverse health effects."*

In September 2012, the NHMRC announced that they are continuing to investigate the impact of wind farms on human health, building on the outcomes of a Scientific Forum hosted by the NHMRC in June 2011. This on-going work by the NHMRC will include a review of scientific literature released since the July 2010 Review to examine the possible impacts of wind farms on human health, including audible and inaudible noise. Following review by the Wind Farms and Human Health Reference Group and a public consultation period it is expected that a revised NHMRC public statement would be available in late 2013.

The NHMRC has recommended that relevant authorities take a precautionary approach and comply with standards relating to turbine design and site evaluation. To address potential concerns regarding health impacts, the Project has been designed to minimise impacts to nearby landowners by adopting a 600 m spacing between turbines, a separation distance of 1.3 km between non-participating landowners and turbines and, in accordance with Development Plan provisions, a separation distance of 2 km from defined settlements or townships.

Notwithstanding the on-going status of the NHMRC's research into the possible health effects of wind farms, the Proponent is not aware of any credible, peer reviewed literature providing evidence of a direct pathological link between wind farms and ill health in humans.

In April 2013 the Victorian Department of Health released a series of fact sheets<sup>27</sup> relating to wind farms, sound and human health which concludes that noise is only able to cause adverse health effects if it is audible, stating:

*"The evidence indicates that sound can only affect health at sound levels that are loud enough to be easily audible. This means that if you cannot hear a sound, there is no known way that it can affect health. This is true regardless of the frequency of the sound."*

The World Health Organisation (WHO) has developed night noise guidelines for Europe<sup>28</sup>. These guidelines look at exposure to noise during sleep and include recommended levels to protect against adverse effects.

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<sup>26</sup> National Health and Medical Research Council (NHMRC) (2010). *Wind Turbines and Health: A Rapid Review of the Evidence, July 2010*

<sup>27</sup> Department of Health (2013) *Wind farms, sound and health*

<sup>28</sup> World Health Organisation (WHO) (2009) *Night Noise Guidelines for Europe*

The WHO report found that:

*“40 dB Lnight, outside is equivalent to the lowest observed adverse effect level (LOAEL) for night noise.”*

The WHO has also released Guidelines for Community Noise<sup>29</sup>, which states that outside bedrooms with open windows, to protect against sleep disturbance, sound levels should be kept to 45 LAeq dB(A).

Noise modelling undertaken by Marshall Day Acoustics demonstrated that the Project is expected to be compliant with the prescribed maximum noise levels set out in the SA EPA Noise Guidelines at all non-involved receivers for all wind speeds between turbine cut-in and rated power.

For landowners involved in the Project, predicted noise levels at occupied residences are below the recommended maximum noise limit of 45 dB LAeq at all wind speeds.

The Proponent has entered into binding agreements with the owners of five dwellings in proximity to turbines (all of whom are landowners involved in the Project) which have the effect of prohibiting use of those buildings for residential or other accommodation purposes during the life of the wind farm. The Proponent has also entered into an agreement to purchase a sixth dwelling owned by an involved stakeholder, which will similarly not be used for residential or other accommodation purposes during the life of the wind farm. Consequently, there is no risk that any person will be living so close to the wind farm as to be subject to excessive noise, even where the person has agreed to host turbines on their property.

Some people are annoyed by wind farm noise, however this can be related to subjective factors such as an individual's general attitude to wind turbines, attitude to changes to the visual character of the local landscape and sensitivity to noise.

In the *Health Effects and Wind Turbines: A Review of the Literature*<sup>30</sup> it was stated that:

*“While it is acknowledged that noise from wind turbines can be annoying to some and associated with some reported health effects (e.g. sleep disturbance), especially when found at sound pressure levels greater than 40 dB(A), given that annoyance appears to be more strongly related to visual cues and attitude than to noise itself, self-reported health effects of people living near wind turbines are more likely attributed to physical manifestation from an annoyed state than from wind turbines themselves.”*

With respect to infrasonic noise levels below the hearing threshold, the WHO stated that:

*“There is no reliable evidence that infrasound below the hearing threshold produce physiological or psychological effects.”*

The NHMRC *Public Statement Wind Turbines and Human Health*<sup>31</sup>, stated that:

*“A recent expert panel review in North America found no evidence that audible or sub-audible sounds emitted by wind turbines have any direct adverse physiological effect (Colby et al. 2009). The principal human response to perceived infrasound is annoyance.”*

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<sup>29</sup> World Health Organization (WHO) (1999) *Guidelines for Community Noise*

<sup>30</sup> Knopper L D & Olson CA (Knopper & Olson) (2011) *Health effects and wind turbines: A review of the literature*

<sup>31</sup> National Health and Medical Research Council (NHMRC) (2010) *Public Statement Wind Turbines and Human Health*

The recent Senate Environment and Communications Committee Report on the *Renewable Energy (Electricity) Amendment (Excessive Noise from Wind Farms) Bill 2012* included a review of health issues. The Committee Report<sup>32</sup> found that:

*“The committee concludes that, while it is possible that the human body may detect infrasound in several ways, there is no evidence to suggest that inaudible infrasound (either from wind turbines or other sources) is creating health problems. In contrast, there is an established literature confirming the existence of psychogenic, or nocebo, effects in general, and at least one study suggesting they may be responsible for symptoms in some wind turbine cases.”*

The Project will meet the stringent noise standards outlined in the EPA Guidelines which have been progressively refined to ensure that local amenity is protected. Given compliance with these guidelines, and the significant setbacks between proposed turbines and nearby residences, the Project is not expected to cause sleep deprivation or ill health.

## 2.7.2 Community division

### *Summary of submissions*

A large number of submissions stated that the Project has created community divisions and split the community into those supporting and those opposing the development.

The concern raised is that landholders who host turbines will gain financially, while their adjoining neighbours have to cope with the way wind farms look and sound without getting any financial benefits and without the ability to dictate where turbines are located. This can create an ‘us and them situation’. Adjoining non farming property owners may also feel that their health is impacted which can cause stress.

### *Response*

Tim Flannery, a well-known Australian environmentalist, recently suggested that the health impacts of wind farms were more likely to result from neighbours being stressed than potential physical effects such as noise or visual. The potential impacts to neighbours are often exacerbated by the feeling that participating landowners are gaining financially from the turbines through annual payments whereas non-participating landowners have the perceived impacts without the compensation.

Those opposing wind farms argue that the only way to avoid community division is to avoid wind farm development. This has not been an issue however with the existing wind farm on Yorke Peninsula and the whole community benefits as a result of jobs, work for contractors, demand for accommodation and community funds. Whilst these broader benefits may not be seen as benefiting those neighbours who see themselves as missing out or suffering amenity impacts, the Project will bring broader benefits to the local and regional community.

The Yorke Peninsula farming community consists of a number of family-held small businesses that compete with each other for agricultural resources in particular the purchase of and leasing of farm land. As a result some socio-economic/hierarchy effect may be felt. Some farmers who may enjoy a competitive advantage over neighbouring farmers due to land quality, quantity and economies of scale may feel themselves at risk of being at a competitive disadvantage to those neighbours who may have wind turbine income.

One of the key purposes of the Statewide Wind Farm Development Plan Amendment (DPA) was to provide greater clarity and certainty for communities and developers in relation to wind farm development. The improved certainty should reduce community angst and division regarding proposed developments.

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<sup>32</sup> Commonwealth of Australia, (2012), *Renewable Energy (Electricity) Amendment (Excessive Noise from Wind Farms) Bill 2012/ Environment and Communications Legislation Committee.*

The Proponent acknowledges that there are a variety of views held by community members towards major projects of any kind and is committed to continuing to engage with all members of the local and regional community. It is clear that major projects such as wind farms bring benefits to the whole community in which they are sited, through on-going jobs, work for contractors, increased demand for local goods and services and community funds.

The Proponent has committed to provide an annual community fund of \$150,000 maintained in real terms for 25 years. That commitment is legally binding through its inclusion in the bankable leases arrangements with hosting landowners (refer below).

### 2.7.2.1 Community benefit fund

#### *Summary of submissions*

A number of submissions raised the issue of community benefit and that the 36 host landowners were benefiting from the wind farm at the expense of the rest of the community.

#### *Response*

The Project will bring a range of benefits to the state, regional and local economies. On the regional scale, the Project will bring direct investment and jobs to the Yorke Peninsula and the Proponent has committed to the establishment of a community support fund. The direct local benefits of the Project have been estimated at \$8 million per annum for the 25 year life of the Project.

The Community Benefit Fund of \$150,000 per annum (indexed to CPI) will be established to support community programs once the wind farm is commissioned and will ensure broader community benefit from the Project.

The Proponent has agreements with 36 landowners to increase benefit to a larger number of landowners rather than having fewer landowners with a greater number of turbines.

### 2.7.3 Workforce accommodation

#### *Summary of submissions*

A number of submissions raised the issue that demand for rental accommodation would impact on tourist and visitor numbers to the area and alternative sources of accommodation will need to be considered.

#### *Response*

The Socio-Economic Assessment undertaken for the Project identified that some displacement of visitors might be experienced during the peak season and proposed liaising with local businesses, Council and Tourism SA to explore accommodation options and opportunities to manage potential impacts, for example temporary accommodation camps. The Proponent is keen to work with the private sector in the provision of workforce accommodation and believes there are significant benefits to the tourism industry in the long term if some of the proposals for development of temporary accommodation put forward by local businesses and external suppliers can be realised. For example, two local businesses have indicated that securing a long term contract to accommodate 40–50 workers would enable them to invest in additional facilities that would be used to provide tourist accommodation once the wind farm construction had been completed. Integrating smaller groups of workers into the community to utilise local goods and services would provide positive benefits for local providers rather than a centralised construction camp that may purchase its requirements remotely.

A number of individuals have also approached the Proponent inquiring about leasing their properties to the Project.

The 2011 Census figures for the District Council of Yorke Peninsula (the Council) indicate that out of a total housing stock of 9,490 private dwellings, some 4,508 (47.5%) were unoccupied on Census night. While many of these vacancies can be explained by absentee owners, it would indicate that there are private dwellings that may be available to accommodate temporary workers. Utilisation of these vacant properties could involve communication with home owners that do not permanently reside in the region through the Council database or through local progress associations.

The large size of the Project's footprint will allow the Proponent to disperse lodgement of the required construction workforce over the townships of Maitland, Ardrossan, Minlaton, Curramulka, Port Julia, Port Vincent and Pine Point in order to control potential increases in rent charged for local accommodation.

The Proponent will work with Council and local business community in formulating accommodation proposals that do not detract from the existing rental market and maximise local opportunities. Until the Project is approved through the Development Act processes and its financial feasibility has been proven in the post-approval/pre-construction phase this is premature.

## 2.7.4 Property values

### *Summary of submissions*

A number of submissions raised the issue of property values and the perception that the wind farm development would devalue their property.

### *Response*

The impact of wind farm development on surrounding property values in Australia has been the subject of two State Government reports.

The *Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values*<sup>33</sup> (the Valuer General's Assessment) was prepared in 2009 for the NSW Valuer General to provide credible and objective information on the subject of land values in areas surrounded by wind farms.

The study reviewed existing literature in relation to property values surrounding wind farms which concluded there was no clear indication that property values were affected as a result of wind farm development. While isolated instances of small negative variations in property prices were noted, these were not able to be substantiated as being the direct result of the wind farm. Conversely, one study indicated property values had in fact increased in the vicinity of a wind farm since its development.

The Valuer General's Assessment also undertook its own investigation which analysed property surrounding six wind farms in Victoria and two in New South Wales. The assessment concluded that the majority of wind farms erected in Australia appear to have no quantifiable effect on land values based on both the analysis of previous studies and their own investigations.

In 2010 the Victorian Senate Report on The Social and Economic Impact of Rural Wind Farms heard submissions based on investigations, including the Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values, which based on analytical evidence did not identify any correlation between wind farms and reduced property prices.

The findings of these Australian reports mirror the findings of similar studies investigating the impact of wind farms on surrounding property values undertaken internationally.

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<sup>33</sup> *NSW Valuer General (2009), Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia*

A study by *Hoen et al*<sup>34</sup> published in 2009 reviewed data from 7,500 sales of family homes within 16 km of 24 wind farms across nine US states. This study found no statistical evidence of widespread property value impacts in communities surrounding wind energy facilities. Another study published in 2010 assessing this issue in Canada by *Canning et al*<sup>35</sup> reviewed property transactions in the Ontario area and reported that where wind turbines were clearly visible, there was no empirical evidence to indicate that rural residential properties reported lower sale prices than similar residential properties within the same area that were outside of the viewshed of a wind turbine. An earlier study<sup>36</sup> from the US published 2003 reviewed more than 25,000 records of property sales in the vicinity of wind farms and also determined that there was no statistical evidence in this data to indicate property values within the view shed of wind developments were affected by wind farms nearby.

Perceived potential impacts to land values usually related to amenity, which is the key factor that the Proponent has the ability to influence through mitigation of any identified impacts of the wind farm.

The Project is permissible under the applicable zoning and land use controls. In these circumstances, the appropriate approach to environmental assessment is to address potential environmental impacts, such as noise, air quality and visual impacts, rather than perceptions of any impact on property values.

Management of amenity impacts is achieved to a significant degree by incorporation of suitable separation distances and in the case of the Project a 1.3 km buffer was selected to reduce potential impacts to surrounding non-participating residences.

A range of environmental investigations were undertaken by the Proponent to assess the potential impacts associated with the construction and operations of the Project, including noise, visual, and shadow flicker impacts. The outcomes of these studies were included in the development application and full copies of the reports provided as appendices to the Development Application.

From the findings of these investigations and the review of literature on potential impacts to property value undertaken in compiling the Development Application, it is not anticipated that the Project will impact on the surrounding value of rural or lifestyle properties. It is considered unlikely that involved landowners will experience a reduction in property values as a result of the Project. These landowners are likely to experience an increase in the value of their properties' value as a result of the additional income streams generated from wind turbines, which may be attractive to prospective purchasers.

## 2.7.5 Safety

### *Summary of submissions*

A number of safety concerns were raised in submissions to the application, including road safety (refer Section 2.8.1), blade throw (refer Section 2.5.5) and access for emergency service vehicles particularly for aerial fire fighting and helicopter retrieval.

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<sup>34</sup> *Hoen, B; Wisner, R; Cappers, P; Thayer, M & Sethi, G; (2009) The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis, Ernest Orlando Lawrence Berkeley Laboratory, December 2009*

<sup>35</sup> *Canning, G & Simmons, L (2010) Wind Energy Study - Effect on Real Estate Values in the Municipality of Chatham-Kent, Ontario, Report prepared for the Canadian Wind Energy Association, February 2010*

<sup>36</sup> *Renewable Energy Policy Project (REPP) The Effect of Wind Development on Local Property Values, Renewable Energy Policy Project, May 2003 (US Government)*

## *Response*

### 2.7.5.1 Emergency services

The Qualitative Risk Assessment undertaken to identify potential aviation risks associated with the Project identified the level of risk to emergency services (air ambulance, police and fire fighting) as low risk to medium risk within close proximity to the wind farm.

The operations of emergency aerial services is subject to strict planning and risk assessment procedures which consider a number of factors, including obstacles, weather and terrain. Wind turbines are considered as large and visible obstacles in these assessments. The Qualitative Risk Assessment was completed prior to finalisation of the Agreement between Aerotech Australasia and the Proponent.

Fire fighting using fire suppression aircraft is only operated in areas where there is no smoke and during daylight hours and the 600 m spacing between turbines would allow aircraft to operate around a wind farm if weather, terrain and visibility conditions for aerial fire fighting were appropriate.

The Proponent has made a commitment to prepare an Emergency Management Plan in consultation with the Country Fire Service to ensure that effective communications and response procedures are in place for the Project. These procedures will cover protocols for operation of the Project and for response of the permanent workforce present on site.

Wind turbines that are part of the Project will be turned off at the request of the CFS if there is a fire in the Project area or in accordance with the protocols of the Emergency Management Plan.

## 2.8 Construction impacts

### 2.8.1 Road maintenance and damage

#### *Summary of submissions*

A number of submissions raised the issue of damage to roads during construction and queried the Proponent's commitment to maintaining roads following construction.

#### *Response*

It will be the responsibility of the party holding the Operation and Maintenance (O&M) contract for the wind farm to ensure roads are all weather and fit for purpose. The design of the roads will include an all-weather requirement and a design life of 25 years (duration of the Project). In addition a maintenance manual will be written as part of the detailed design process.

It is standard O&M practice for a civil engineer to undertake an annual spring and autumn survey to assess road conditions and plan preventive maintenance as required.

The Proponent will be required to enter into a formal agreement with Council in relation to upgrade requirements to Council infrastructure or for the reinstatement of any infrastructure damaged during the construction phase. A detailed dilapidation study would be undertaken prior to construction and used as a benchmark and reviewed throughout the life of the Project and agreed to by both parties.

The Proponent supports this being included as a condition of development approval.

## 2.8.2 HVDC marine cable construction management

### *Summary of submissions*

The EPA submission queried the extent of dredging operations and associated activities, particularly in relation to the Barker Inlet/ St Kilda area.

### *Response*

Whilst the extent and scope of dredging activities (jet trenching and ploughing), Horizontal Directional Drilling (HDD), surface cable laying and other associated activities will be determined during preliminary investigations, the Proponent is aware of its legislative requirements in relation to dredging, discharge to marine waters and earthworks which are prescribed activities under Schedule 1 of the *Environment Protection Act 1993*.

As outlined in Section 2.5.11.1, a Construction and Environmental Management Framework has been prepared for the cable component of the Project. The framework provides guidance for the management of environmental impacts during installation of the marine cable and identifies mitigation measures to be implemented during construction. A copy of the framework is provided as Appendix E.

The framework provides further detail on the proposed construction methodology and the impacts associated with jet trenching and ploughing along the cable alignment. Following consultation with the EPA, the Proponent has committed to using sidescan sonar or marine divers rather than undertaking a pre-installation grapnel run to clear debris from the seabed along the final cable route in sections of the route that intersect sensitive seagrass communities. The Proponent will liaise with the EPA in refining the final proposed installation method for the HVDC cable, using a combination of HDD, jet trenching and ploughing and potentially laying part of the cable on the surface of the seabed (surface lay), in order to reasonably minimise impacts on seagrass communities in the vicinity of Port Julia and St Kilda.

A Turbidity Monitoring Program for the jet trencher near Barker Inlet would be developed and would include appropriate trigger levels for cessation of jet trenching activity when turbidity levels are considered to result in unacceptable impacts to the environment surrounding Baker Inlet and St Kilda.

A Marine Pest Management Plan will be developed in consultation with the EPA following marine survey for the invasive algae *Caulerpa taxifolia* along the finalised cable route.

The Proponent has made a number of commitments based on feedback received from the EPA for consideration during the detailed design phase of the Project which are detailed in Section 5 of this Response Document.

## 2.8.3 Existing infrastructure

### *Summary of submissions*

DMITRE raised the proximity of the cable alignment to both the SEA Gas' *Port Campbell to Adelaide* and Epic Energy's *Moomba to Adelaide* High Pressure Natural Gas Transmission Pipelines in Gulf St Vincent and the requirement for the cable to intersect both pipelines as an issue of concern.

### *Response*

Following project approval, the Proponent will commence the preparatory phase of the marine cable construction which includes seabed surveys, route optimisation and risk assessment. The risk assessment stage identifies hazards along the preferred route, such as existing infrastructure, and identifies control measures to manage existing infrastructure prior and during construction.

The Proponent is consulting with SEA Gas and Epic Energy to assess and address potential threats from the HVDC intersecting the SEA Gas and Epic Energy pipelines. The Proponent would support a condition regarding liaison with SEA Gas and Epic Energy to identify possible threats to pipeline integrity from the proposed development.

## 2.8.4 SA Water

### *Summary of submissions*

SA Water provided feedback to the Proponent in the period following exhibition of the Project's Development Application in relation to their ability to provide water to the Project during the construction phase.

### *Response*

The Proponent responded to SA Water's request for further information on the timing and volume of water anticipated to be required to support activities throughout the construction of the Project such as concrete batching, road construction, dust suppression, drinking water supply and fire risk management.

Following correspondence with the Proponent, SA Water has indicated that it expects to be able to provide water through its networks to the Project and that it will work with the Proponent to further develop a strategy to supply water for construction during the detailed design phase.

## 2.9 Decommissioning

### *Summary of submissions*

The arrangements in relation to decommissioning of the Project infrastructure were questioned in a number of submissions. It was suggested in some submissions that the Project has not given sufficient consideration to which parties will retain responsibility for the timely decommissioning of Project infrastructure.

### *Response*

The Project has an expected life of 25 years. Once the life of the wind farm is completed then the towers, nacelles and blades will be removed at the wind farm owner's cost. The turbine foundation will remain in-situ and will be covered by a layer of compacted topsoil. Underground cables comprising the Project's internal electrical reticulation system will de-energised and also remain in situ.

The Project HVDC transmission cable has an expected life of at least 40 years and potentially as long as 50 years. The decommissioning of the HVDC asset (converter stations and cables) will be driven by the long term role the asset plays in the greater SA transmission system. If the HVDC asset is decommissioned then the cables would remain undersea and underground but de-energised, as is typical practice. The converter stations could be removed or partly modified for an alternate use in consultation with the ElectraNet.

The agreements between the Proponent and involved landowners whose holdings comprise the project area include a specific decommissioning clause, which provides that:

- On the surrender, cancellation or termination of the Lease in respect of the whole or any part of the land subject to the Lease, the Lessee (the wind farm owner) will remove from the lease area all its equipment (except for any permanent roadways and other improvements constructed by the Lessee, which shall be removed by the Lessee only if required by the landowner or required by law), repairing all damage caused, restoring the surface of the land (including remediating the soil to a depth of not less than 0.6 metres) to a suitable condition for pastoral or other agricultural use (having regard to its condition and use prior to the equipment having been installed) and leaving the lease area electrically safe and

otherwise in a safe condition free from hazardous structures and material (if any) introduced on to the lease area by the Lessee.

- If the Lessee fails to carry out any of its decommissioning obligations then the landowner is entitled to carry out the works at the cost and expense of the Lessee.
- Ownership of equipment not removed from the relevant lease area within six (6) months of the end of the lease will vest in the landowner.

## 2.10 Community and stakeholder engagement

### *Summary of submissions*

A number of submissions queried the adequacy of the community engagement process and the sufficiency of the opportunities provided to the public to comment on the Project.

### *Response*

The Proponent is committed to working with the communities in which it operates and, as such, has been proactively working with the community and stakeholders to advise them about the Project and provide opportunities to input into its development and build relationships with the community.

### 2.10.1 Engagement prior to lodgement of development application

The Project was announced in August 2011 and since its announcement the Proponent has been activity engaging with key agencies, stakeholders, interested parties and the local community.

Between August and December 2011, meetings were held with a number of groups or agencies with an interest in the Project. Project briefings were held with a range of Government agencies to inform them of the Project, clarify requirements for the supporting studies and discuss specific issues regarding the Project. Consultation has been undertaken with a range of local interest groups, stakeholders, businesses and companies to outline the Project and identify issues at the regional and local level.

Two community open days were held to inform the planning and design process, the first in October 2011 and the second in December 2011, to outline the Project, listen to local issues and provide fact sheets detailing the Project and approval process.

The Proponent has engaged extensively with nearby landowners since the announcement of the Project and has worked directly with involved landowners to reach agreement on elements of the Project's layout and design.

### 2.10.2 Public exhibition period for Development Application

The Development Application was lodged with the DAC in January 2013. The 9 week public exhibition period for the Development Application commenced on 12 February and ended on 18 April 2013.

During the public exhibition period, three community information days were held by the Proponent to provide information on the Project and the approval process and to respond to questions. The following 3 days with 10 sessions were held:

- Sunday 13 January 2013, 1–4 pm, Curramulka Community Club, Curramulka
- Wednesday 16 January 2013, 5–8 pm, Port Vincent Bowling Club, Port Vincent
- Saturday 19 January 2013, 1–4 pm, Port Julia Community Hall, Port Julia.

All interested parties were given the opportunity to make written submissions to the DAC during the exhibition period, and the Proponent has prepared this Response Document in order to respond to questions, comments and requests for further information that were raised in the submissions.

## 2.11 Planning assessment

The Development Application referenced a superseded consolidation of Council's Development Plan. The assessment refers to the 22 March 2012 consolidation, whereas the version of Council's Development Plan current at the time of application lodgement was the 22 November 2012 consolidation.

The proposed wind farm is located within the Primary Production Zone of the District Council of Yorke Peninsula's Development Plan (consolidated 22 November 2012). The Primary Production Zone abuts a number of other zones within the Council's LGA including Rural Living, Caravan and Tourist Park Accommodation, Settlement, Settlement Black Point Policy Area 3, Community, Residential, Coastal Conservation, Coastal Open Space (Precinct 1 Black Point) and Coastal Settlement. The townships of Port Vincent, Curramulka, Port Julia, Black Point, Pine Point and Sheoak Flat are located within these adjacent zones.

Of particular interest in the updated Council Development Plan is the settlement of 'the Dipper' which is now covered by a Coastal Settlement Zone (previously it was Coastal Zone). A wind turbine (number 221) was proposed to be located approximately 1,650 m from the edge of the Coastal Settlement Zone of 'the Dipper'. This was not in keeping with the 2,000 m separation of proposed turbines from zones which envisage more sensitive uses that is a feature of the Project's design and as a result this turbine has been removed from the proposed layout.

Following the exhibition period for the Development Application, the Proponent commissioned URPS to undertake an independent detailed planning assessment of the Proposal. The report of this planning assessment (Planning Assessment Report) is attached as Appendix F to this Response Document.

The Planning Assessment Report contains analysis of the Project for consistency with all relevant Development Plan provisions (including those in the District Council of Yorke Peninsula Development Plan, the City of Salisbury Development Plan, the Land Not Within a Council Area (Coastal Waters) Development Plan and the Land Not Within a Council Area (Metropolitan) Development Plan).

The Planning Assessment Report concludes that the Project conforms with the relevant zones' goals, is in substantial accord with the relevant Development Plans, and merits development plan consent.

In particular, the Planning Assessment Report concludes as follows:

- *the proposed wind farm and its associated infrastructure elements, site works and converter stations are an integral part of the proposed renewable energy outcome, a desired use/activity;*
- *the physical elements of the proposed wind farm are considered to form an essential part of the landscape of the Primary Production Zone (as expressed in the Zone Desired Character) in which the primary above-ground infrastructure, and all wind turbines, are located;*
- *the visual amenity of the wind farm is suitably managed through the buffer separation and the physical/visual separation achieved from townships and settlements and non-stakeholder dwellings;*
- *the proposed wind farm conforms with relevant EPA Guidelines and peak industry standards with respect to relevant impact considerations (noise, shadow flicker, blade glint, and the like);*
- *critical to the turbine locations is the maintenance of productivity from this cereal belt farming community. Under further amendments made by the applicant the wind farm is to be managed to allow unfettered continuation of fixed wing aerial spraying of its surrounds. As such, it is the*

*footprint of the turbines and proposed buildings alone which limit primary production from the land;*

- *the impact on the natural and cultural values of the locality are also appropriate, or able to be appropriately managed, as scoped by the application documents (to be further detailed under the CMP);*
- *amendments to the application and conditions attached to the final design of converter stations ensure that all dwellings (whether stakeholder or otherwise) and sensitive land uses are suitably protected in accordance with the relevant noise goals; and*
- *marine and terrestrial cabling is to be carried out to minimise construction impacts by employing directional boring through sensitive coastal/near coastal environments. Impacts are confined and short-lived, there being no long-term impacts and few practical impediments to the use of land through which the cabling is to be carried out.*



## 3. Yorke Peninsula Council

The majority of the Project components, including the wind turbines, one converter station and the operations compound, are located within the area of the District Council of Yorke Peninsula.

While the relevant authority for granting development authorisation for a Crown Development is the Minister for Planning, with assessment support from the Development Assessment Commission (DAC), the Council is invited to make comment on the application to the DAC.

Following the formal lodgement of the Development Application with the DAC in January 2013, the Council was advised of the application in accordance with the provisions of the *Development Act 1993*. Council made comment on and sought clarification of a number of matters on 8 February 2013 and the Proponent provided a written response to Council on 22 February 2013.

The Proponent also met with Council officers and some elected members on 26 February 2013 to discuss the responses in person. During that meeting it was determined that further explanation was required on a number of the issues and a subsequent response advice was provided to Council on 12 March 2013 with another face to face meeting on 13 March 2013.

### 3.1.1 Council Planning Assessment

The Ceres Project was formally considered by Council at a meeting of Council held on 27 March 2013 and it was resolved that Council does not support the Project. At that meeting, the Council considered a planning assessment report that had been prepared on behalf of the Council.

Following the Council's resolution, the Proponent commissioned URPS to undertake a peer review of the report that had been provided to the Council. A copy of the planning assessment review report prepared by URPS is attached as Appendix G to this Response Document. The Council was provided with a copy of the URPS planning assessment review report and given a presentation by its author at a Council meeting held on 24 July 2013. The conclusions of the review were as follows:

*'The analysis in the assessment report to Council on the Ceres Wind Farm is undertaken individually against each of the topic headings in the General Section of the Development Plan, as well as the Primary Production Zone. This assessment format is considered to be flawed in that it 'artificially' compartmentalises the consideration of key issues, making assessment against the many and varied provisions of the Development Plan in the context of one another difficult, and is consequently somewhat misleading.*

*A more robust and transparent approach to development assessment is considered to be issues-based, similar to the structure of this report i.e. thematic consideration of provisions relating to land use, appearance of development/visual impact, noise impact etc. Such a format allows for the more appropriate and holistic consideration of issues-based provisions within the various sections of the Development Plan. The Development Assessment Commission, for example, uses this type of report format in assessing Development Applications.*

*The report to Council also contains a number of assessment errors and inaccurate interpretations of the relevant provisions of the Yorke Peninsula Development Plan that could give a misleading impression to a reader of the report as to the extent that the development is consistent with the relevant provisions of the Development Plan.'*

*'The assessment/procedural errors and inaccurate interpretations of the relevant provisions of the Development Plan are such that the report to the Council was misleading.*

*It is common for Development Plan Consents for large-scale development proposals, such as wind farms, to incorporate a number of conditions of consent that address a wide range of detailed design issues. The report to Council concludes, in part, that there is “insufficient information being provided to make an informed assessment”. However, all of the issues described as requiring additional information have already been addressed as part of the application or can be readily managed via practical conditions of consent.*

*It is recommended that the Council be made aware of these issues with its internal planning advice and that Council be given the opportunity to reconsider its position regarding the Development Application.’*

The Proponent has continued to engage with the Council regarding the Project and has provided the Council with regular updates regarding progress with the assessment of the Development Application.

### 3.1.2 Additional information

Prior to finalising its planning assessment of the Project, the Council submitted comments and further queries to the Proponent regarding a number of matters that the Council considered relevant to its consideration of its position.

#### 3.1.2.1 Potential Infrasound impacts

##### *Council comment*

Council requested further information on the potential long term impact of infrasound on human health.

##### *Response*

The effects of infrasound and how it is generated is discussed in Section 2.5.1.2.

The potential health concerns in relation to wind farm developments are discussed in Section 2.7.1.

#### 3.1.2.2 Operations compound and landscape plan

##### *Council comment*

Council commented that no plans on the operations compound were provided as part of the application, including a landscaping plan.

##### *Response*

The Development Application included a concept site plan which outlined infrastructure required for a converter station and operations compound.

A detailed design will be provided prior to construction commencing which will identify construction materials, building colour, sound attenuation and landscaping plans as per Council regulations. The Proponent would accept such a condition being attached to any approval.

#### 3.1.2.3 Formal landowner agreements

##### *Council comment*

Council raised the concern that several houses were being impacted by shadow flicker and that no details of the formal agreements with landowners that prevent the habitation of dwellings impacted by shadow flicker had been provided to Council.

### *Response*

The shadow flicker assessment identified five receptor locations where shadow flicker will potentially exceed the guideline limit. These locations are all houses owned by participating landowners. The participating landowners have elected to limit the use of these buildings, such that they will not be used as residential accommodation during the life of the wind farm in order to maximise the potential for their property to host turbines as part Project. Limitations on the use of these buildings are documented in agreements with the landowners which will also bind future owners of the properties. While mitigation measures to eliminate the effects of shadow flicker on these buildings could be implemented, a conservative approach to shadow flicker safety was adopted and the Proponent has entered into the agreements with landowners to ensure that no person was placed at potential risk of annoyance from shadow flicker.

#### 3.1.2.4 Crime prevention analysis

##### *Council comment*

Council raised the concern that no crime prevention analysis had been undertaken to ensure best practice crime prevention measures are adopted.

##### *Response*

The development application states that the operations compound will be fully enclosed by a security fence and appropriate lighting will be installed for safety and security purposes. The details of such security arrangements for the operations compound will be addressed as part of the detailed design and provided in the final building plans presented to the certifier prior to construction commencing.

In accordance with standard practice during construction, all construction compounds and work areas will be fenced to limit public access during construction and appropriate signage will be installed at construction compounds and work areas to maximise public safety.

#### 3.1.2.5 Non-participating landowners and farming practices

##### *Council comment*

The Council queried the ability for non-involved landowners to implement best practice farming practices following construction of the wind farm.

##### *Response*

The Development Plan provides clear guidance on setbacks from non-participating residents and from areas with particular zoning and the project design has been structured to comply with these provisions.

Neither the Development Plan, the draft National Guidelines nor any other relevant statutory policies include any requirements as to setbacks from the boundaries of non-involved neighbouring properties, where the land on the boundary is not being put to a sensitive use.

Given that the Project complies with all relevant guidelines relating to protection of local amenity, and given the work done by the Proponent to ensure that the wind farm will not affect the productive capacity of adjacent land, it is reasonable to conclude that the Project satisfactorily minimises potential impacts on neighbouring properties and will not limit the ability for adjacent landowners to continue to carry out either existing or improved farming operations.

An Aerial Spraying assessment concluded that the worst case impact of the wind farm on use of agricultural aircraft is relatively small even before considering the implementation of mitigation strategies.

In addition, an agreement has been executed between the Proponent and Aerotech Australasia (sole current supplier of aerial spraying services to the Yorke Peninsula) to facilitate the continued provision of aerial agricultural services by Aerotech to adjacent properties without change to service, cost or quality.

The agreement prescribes an agreed set of communication and operation protocols between Aerotech and the Proponent, whereby turbines near the boundaries of adjacent non-involved landowner properties would be turned off and blades would remain stationary during aerial spraying. In addition, the turbine structure would be moved to ensure the turbine blades were aligned to be parallel to the flight path of the fixed wing aircraft. This would provide a clearance of at least 60 m and to further reduce risks, the wind turbines within 500 m of boundaries of non-involved landowner properties would also be turned off to eliminate any risk of turbulence.

The Agreement, in addition to the proposed mitigation measures, demonstrates that the Proponent has made all efforts to avoid or minimise impacts on farming production as a result of the construction and operation of the Project. Whilst the aerial assessment indicated a worst case impact on aerial spraying of 3 per cent of the area of adjacent properties, the agreement will ensure that existing services continue unchanged and at no additional cost to the adjacent landowners, which demonstrates that the Project is compatible with the existing farming practices and would have a negligible impact on the productive capacity of the farming activities in the zone within and adjacent to the wind farm.

### 3.1.2.6 3 WTG's within 100 m of conservation zone

#### *Council comment*

Council identified that three turbines were located within 60 m of a conservation zone rather than 100 m.

#### *Response*

To manage remnant native vegetation and to reflect the condition and conservation significance of the native vegetation in the project area the Proponent adopted a self-imposed classification which ranked native vegetation into three zones, 'Conservation', 'High Recovery Potential' and 'Highly Modified'.

A buffer of 100 m has been adopted as the 'ideal' separation distance between native vegetation and turbine placement however it should be noted that this buffer is based on a precautionary approach and ecological expertise.

Whilst there is no legal obligation for the developer to provide a buffer and no industry standard, the most appropriate means of managing potential impacts on birds and bats is to provide an adequate buffer from key habitat. Of the 198 turbines only three turbines are proposed near conservation zones that do not meet the ideal buffer of 100 m. In these instances a buffer of 60 m has been adopted.

In regards to the conservation zone, no infrastructure has been placed within this zone and only 3 turbines are proposed near a conservation zone. These turbines have a 60 m buffer which from an ecological perspective is considered adequate.

### 3.1.2.7 Hazard analysis and bushfire risk

#### *Council comment*

Council raised the issue that a hazard analysis in relation to bushfire risk at each turbine site and the operations compound was not provided with the Development Application.

### *Response*

A fire risk safety assessment was undertaken as part of the development application to assess the potential risk associated with the wind farm development. The assessment included the identification of a number of management measures to reduce the risk of fire at the wind farm.

A Scope Construction and Environmental Management Plan (CEMP) was included as part of the development application which includes an emergency and fire management plan. The Scope CEMP has been prepared to identify the environmental management and mitigation measures to be implemented by the Proponent and its Contractor(s) during the construction of the Project.

The contractor will need to prepare a CEMP, including an Emergency Management Plan that addresses any issues relating to hazard management and the risk of bushfire, prior to commencing construction.

All on-site staff will be trained in fire management and on-site fire protection systems provided.

A condition of development approval requiring the contractor to liaise with Council and the CFS as part of the preparation of the plan would be acceptable to the Proponent.

### **3.1.2.8 Water supply for construction activities**

#### *Council comment*

Council commented that no analysis had been provided with the Development Application on the impacts on water supply as a result of water use to operate the batching plant, civil construction and fire fighting on the broader region, particularly during periods of peak water use.

#### *Response*

The Proponent provided details to Council in response to this question during the public exhibition period.

Four types of water are required for the Project namely water for concrete, water for drinking, water for civil construction and water for fire fighting.

As concrete batching plants exist locally, it is reasonable to assume that water can be sourced locally as part of a commercial agreement. The water requirements of the Project during its construction phase have been assessed as part of consultation between the Proponent and SA Water. Following preliminary assessment, SA Water has indicated that it expects that the needs of the Project can be serviced through the existing SA Water network. Further detail on this issue is provided in Section 2.8.4.

Any off-site water being carted will be fully detailed in the construction traffic management plan (CTMP). This plan will be prepared in consultation with the council and the DPTI during the detailed design phase of the Project and will be approved prior to construction commencing.

### **3.1.2.9 Workforce accommodation**

#### *Council comment*

Council was concerned that an analysis of the impacts of short-term workers accommodation in relation to tourism and permanent rental availability was not provided with the Development Application.

#### *Response*

A Social Impact Assessment was undertaken to inform the development application and the impact to housing and accommodation was considered as part of this assessment. The assessment identified that some displacement of visitors might be experienced during the peak season and proposed liaising with local

businesses, Council and Tourism SA to explore accommodation options and opportunities to manage potential impacts, for example temporary accommodation camps.

As discussed with Council during the public exhibition period, the Proponent is committed to working with Council and the local business community to maximise local opportunities for the provision of workforce accommodation.

A number of local businesses have indicated that if they could secure a long term contract to accommodate 40–50 workers it would enable them to invest in facilities that could be converted to tourism use once the wind farm construction had been completed. Integrating smaller groups of workers into the community to utilise local goods and services would provide positive benefits for local providers rather than a centralised construction camp that may purchase its requirements remotely.

The Proponent has also been contacted by various individuals inquiring about leasing their properties to the Project and is aware of the latest Census information that indicates that over 40 per cent of private dwellings in the region are currently unoccupied.

In formulating an overall plan for workforce accommodation, the Proponent will seek to disperse the workforce to help control higher rents. An opportunity the Proponent is keen to explore is to communicate with home owners that are not permanently based in the region to get a register of owners interested in renting out their properties. This would target properties that are not normally in the rental market and would reduce the impact on non-involved tenants and tourists.

### 3.1.2.10 Indemnification from litigation in relation to Council's infrastructure

#### *Council comment*

No information was provided to the Council demonstrating how Council would be indemnified from litigation in relation to Council infrastructure and the development of the wind farm.

#### *Response*

In relation to local roads, the design philosophy for the Project is to maintain and better local roads. The Proponent has acknowledged that a formal agreement between the Proponent and Council will need to be entered into in relation to Council infrastructure. A detailed dilapidation study prior to construction will need to be undertaken which will be treated as the benchmark and reviewed throughout the life time (both construction and operation) of the Project at time agreed by both parties.

The design of roads will include an all-weather requirement and a design life of 25 years. A maintenance manual for the Project will be prepared as part of the detailed design phase.

It is standard operation and maintenance practice for a civil engineer to undertake annual spring and autumn surveys to assess road conditions and plan preventative maintenance as required.

### 3.1.2.11 Traffic management

#### *Council comment*

Council commented that a detailed Traffic Management Plan was not provided as part of the development application.

#### *Response*

A traffic and transport assessment was undertaken for the development application which included a number of mitigation measures that are detailed in the Scope CEMP for the Project.

The Proponent will need to prepare a traffic management plan prior to any transportation of components to the wind farm site. The plan will be developed in consultation with the Council and DPTI during the detailed design phase of the Project. The Proponent would accept such a condition being attached to any approval.

Details on how traffic will be managed and what agreements will be entered into in terms of road management between the proponent and Council are discussed in Section 2.5.9 of this Response Document.

### 3.1.2.12 Telecommunications interference

#### *Council comment*

Council commented that no analysis of mitigation of interference with existing telecommunication facilities was provided with the Development Application.

#### *Response*

An electromagnetic interference study was undertaken for the development application to assess the potential impacts from the proposed wind farm. The study included mitigation measures where required. A copy of the report was provided as Appendix G to the application, as well as being discussed within the development application.

Electromagnetic interference and mitigation measures are discussed in Section 2.5.8 of this Response Document.

### 3.1.2.13 Management plans

#### *Site rehabilitation plan*

#### *Council comment*

Council commented that a rehabilitation plan, including options for environmental offsets and decommissioning works, were not provided as part of the development application.

#### *Response*

Any native vegetation clearance will require approval under the *Native Vegetation Act 1991* and a significant environmental benefit (SEB) will be required to offset the clearance. Whilst a number of landowners have expressed their desire to be involved in native vegetation offsets on their land it is premature to provide details on offsets until the development approval process has been finalised.

The development application includes a section on decommissioning and landowner agreements include a specific clause in relation to decommissioning of the wind farm.

Further discussion of decommissioning of the Project (wind farm and cable) is provided in Section 2.9 of this Response Document.

#### *Bushfire management plan*

#### *Council comment*

Council commented that a Bushfire Management Plan had not been provided with the development application.

### Response

A Scope CEMP was included as part of the development application which includes an emergency and fire management plan. The Scope CEMP has been prepared to identify the environmental management and mitigation measures to be implemented by the Proponent and its contractor(s) during the construction of the proposed wind farm and associated infrastructure.

The Proponent will need to prepare a Construction and Environmental Management Plan, including an Emergency Management Plan, prior to commencing construction.

A condition of development approval requiring the Proponent to liaise with Council and the CFS as part of the preparation of the plan would be acceptable to the Proponent.

### Cultural heritage management plan

#### Council comment

Council commented that a Cultural Heritage Management Plan for both Aboriginal and European heritage had not been provided as part of the development application.

#### Response

The Scope CEMP included as part of the development application includes an indigenous and non-indigenous heritage management plan.

The Proponent is aware of its legislative requirements under both the *Aboriginal Heritage Act 1988* and the *Heritage Act 1993*. The contractor will need to develop a Cultural Heritage Management Plan outlining how it will comply with these statutory requirements prior to construction commencing.

### 3.1.2.14 Community development fund

#### Council comment

The Council raised concern that no specific detail on the establishment of a Community Development Fund and its expenditure had been included in the development application.

#### Response

The Proponent is committed to the establishment of Community Support Fund and following project approval will develop a strategy for community funding and investment. The Proponent will work with the local Council to establish a process to invest the funds into the community and establish criteria for funding eligibility.

### 3.1.2.15 Native vegetation clearance

#### Council comment

Council raised concerns regarding the proposed clearance of up to 18.5 hectares of native vegetation on the operations compound/converter station site.

#### Response

The operations compound/converter station site was selected as the preferred site for a number of reasons, including its low productivity value as agricultural land. While the proposed buildings have generally been sited on the western part of the property (where the vegetation is of the lowest quality) to minimise impacts to native vegetation, some clearance is required. Of the 18.5 ha just over 8 ha has been rated in very poor or

poor condition with the remainder only rated in moderate condition with most of the vegetation proposed to be removed consisting of mixed grassland and open sedgeland.

The proposed clearance requirements for this site are based on the worst-case scenario. The detailed design phase will minimise impacts to the vegetation on site, as well as locating infrastructure in areas of lowest quality vegetation where possible.

Furthermore, a site landscaping plan will be developed as part of the detailed design phase for the operations compound site. This plan will protect existing roadside vegetation and reinforce it with additional similar species while also providing visual screening to the facilities to be located on the site. The Proponent is keen to work with Council in developing the landscape plan to ensure mutual objectives are met and agrees to this being a condition of any approval.

### 3.1.2.16 Impacts on bats

#### *Council comment*

Council raised the issue of the potential effects of turbines on the population of bats on the Peninsula and suggested that additional investigations be undertaken prior to the potential for impact.

#### *Response*

The project area is extensively cleared and predominantly comprises cropping and grazing land. Native vegetation is limited to scattered patches on private land, and roadside strips, hence there is a very low utilisation by most species in the project area.

The flora and fauna surveys undertaken for the Project included an assessment of bats. Even though bat species are rarely identified in database searches for the project area a Level One investigation for bats was undertaken. The survey methodology was based on the AusWind Best Practice Guidelines (AusWind 2006).

Four bat species were recorded and none of the species recorded have a conservation rating. The placement of turbines has minimised impacts to native vegetation and habitat by identifying 'no go areas' for patches of native vegetation, where bat species are likely to occur, and adopting a minimum buffer of 100m for areas of value for bats or potential habitat, such as mallee and woodland associations. Project ecologists EBS developed a flora and fauna management plan, which included a number of fact sheets for at-risk fauna such as bats, to manage potential impacts during the construction and operation of the wind farm. Given that little is known about the impact of turbines on bat behaviour and bat strikes as a result of wind farms, monitoring is proposed to manage potential impacts during the operation phase.

Undertaking further investigations at this stage will not provide greater understanding of bat behaviour and interactions with turbines for a number of reasons. The number of bat calls on an Anabat is not directly correlated to activity i.e. one bat could make 100 calls or 100 bats could make one call each. The survey methods currently available do not provide any detail on heights that bats are flying at and therefore whether they are at risk or particular species are at risk. Whilst there have been bat deaths associated with wind farm projects, without the basic ecology information for an area, this does not allow any conclusions to be drawn in relation to potential impact on a species.

Furthermore, while bat trapping is a useful tool it only captures those species that are flying low enough (i.e. <4 m from the ground) and does not afford insights on what bats are doing 40 m+ off the ground.

Monitoring is required to improve knowledge of potential impacts and to understand the interaction between bats and turbines. Monitoring will provide an understanding of the bat species present, their distribution, densities and behaviours pre construction, post construction and during operation.

It has been recommended that a monitoring program is implemented prior to turbine construction and continues for at least two years into the operation phase of the Project. The program would include:

- Formal record keeping of any observed bat mortalities associated with wind farm infrastructure, to be reported to external environmental agencies as part of annual performance reporting.
- Once the turbines are operational, surveying for bat carcasses at regular intervals (e.g. weekly) at selected turbines locations. The need to continue bat mortality monitoring will depend on the detection counts.
- Establishment of permanent Anabat monitoring at selected turbine locations across the project area, including high risk sites from a bat perspective (i.e. near and between woodland patches and wooded roadside corridors). Anabats should also be set at the nacelle level of turbines to record bat activity within the potential strike zone.

If monitoring shows a significant impact on bat populations during the operational phase of the wind farm, a number of mitigation measures have been recommended, including the use of markers or radar technology. Shutting down of turbines during extreme low visibility events and when there are large numbers of bats passing through the site to prevent collisions will also be investigated if bat strikes are showing a significant impact on bat populations.

## 4. Salisbury Council

The eastern converter station and cable alignment (from St Kilda to the converter station site) are located within the area of the City of Salisbury.

The City of Salisbury's Development Control Unit considered the Development Application at its meeting held on 21 March 2013 and submitted a number of comments to the Proponent.

### 4.1 Converter station

#### *Council comment*

Council sought further details in relation to the proposed converter station, including building dimensions and materials as well as landscaping to screen the development and reduce the visual impact on the proposed locality.

#### *Response*

The development application provides an overview of the operations compound and a concept plan for the site. Following project approval, the Proponent will commence detailed design of the converter station site. The final building plans will need to be certified prior to construction commencing.

A condition of approval requiring detailed site plans to be developed in consultation with Council would be acceptable to the Proponent.

Similarly, the landscaping plan for the converter station can be dealt with as a condition of development approval.

### 4.2 Cable alignment

#### *Council comment*

Council raised a number of queries in relation to the cable alignment, particularly in relation to existing infrastructure along the alignment route and the avoidance of flora and fauna and trees.

#### *Response*

The cable alignment has been designed to minimise impacts to flora and fauna and where possible micro-siting will be undertaken to avoid plantings or loss of trees. The detailed design phase will identify constraints along the alignment, such as existing infrastructure.

A condition of approval requiring the Proponent to liaise with Council during the detailed design phase would be acceptable to the Proponent.



## 5. Detailed design

The Proponent makes the following commitments based on engagement with the EPA. It is proposed that these commitments are included as conditions of approval and will be satisfied during the detailed design phase of the Project, prior to the completion of the Construction and Environmental Management Plan(s). The commitments include:

- utilisation of a combination of design and mitigation strategies in the selection of equipment and layout of the Converter Station facility to demonstrate compliance with the EPA's noise criteria at nearby receivers
- completion of soil surveys, survey for the invasive marine algae *Caulerpa taxifolia* and geotechnical investigation of Gulf St Vincent in order to optimise the proposed HVDC cable route and wherever practicable avoid or mitigate potential impacts to the marine environment
- completion of detailed investigations to confirm the proposed HVDC construction methodology and final extent of jet trenching, HDD and surface cable lay required
- preparing a Dredge Management Plan including specific measures for jet trenching and dredge ploughing works, including monitoring and shut down levels
- preparing a Marine Pest Management Plan in consultation with the EPA
- preparing a Turbidity Monitoring Program that complies with water quality targets determined by the EPA
- compilation of a risk assessment to guide the construction process and minimise potential environmental impact in the vicinity of Barker Inlet (following submission of finalised HVDC construction methodology)
- consultation with the EPA regarding assumptions to be used by the Proponent and any contractor(s) in the preparation of Management Plans to be included in the CEMP.

In response to submissions on potential loss of efficiency in the application of aerial agricultural services, the Proponent undertakes that in the event that an aerial spraying service provider other than Aerotech proposes to undertake aerial spraying services on land adjacent to the wind farm the following commitments will be observed:

1. The Proponent will offer to enter into an interface agreement with that provider that provides, at a minimum, or as agreed with the provider, for the same communications and operation protocols as the Aerotech agreement.
2. Subject to 1. above, where required during aerial spraying, turbines near the boundaries of relevant adjacent non-involved landowner properties will be turned off, and blades will remain stationary and aligned to be parallel to the flight path.
3. Subject to 1. above, where required during aerial spraying, turbines within 500 m of boundaries of relevant non-involved landowner properties will be turned off where there is risk of turbulence from the turbines impacting on the spraying operations.

## Construction planning

Following project approval the Proponent will need to undertake further work to progress to construction of the Project. This work will include (but is not limited to):

- Preparation of detailed plans of converter station and operations compound during the detailed design phase. The detailed design will include:
  - ▶ a landscape plan for the site including visual screening of buildings, protection of roadside vegetation and vegetation clearance requirements
  - ▶ details of water use for concrete, drinking, civil construction and fire fighting requirements
  - ▶ noise mitigation measures
  - ▶ consultation with Yorke Peninsula and Salisbury Councils.
- Following completion of the detailed site plans for the converter station site at Port Julia, engagement with the Native Vegetation Council regarding native vegetation clearance requirements. An environmental offsets strategy and liaison with landowners regarding revegetation works on their land will occur as part of this process.
- Preparation of a Traffic Management Plan in consultation with the District Council of Yorke Peninsula and the DPTI during the detailed design phase, which will be approved prior to commencement of construction. Road safety will be a key objective in the development of this plan. Some of the standard practice measures included in Traffic Management Plans for wind farms are:
  - ▶ reduction of speed limits
  - ▶ road closures and haulage routes
  - ▶ additional signage (education/traffic management)
  - ▶ restriction of vehicle movements at certain times of day (school bus/stock movements)
  - ▶ reduction of light vehicle movements outside of stand construction hours (i.e. project bus for central locations with project accommodation)
  - ▶ complaints management system – including a hotline
  - ▶ monthly reporting on performance to stakeholders (i.e. Council/DPTI).

A dilapidation study of Council infrastructure will be undertaken and agreed to by both Council and the Proponent prior to construction commencing. The Proponent and Council will need to enter into a formal agreement in relation to upgrade requirements to Council infrastructure or for the reinstatement of any infrastructure damaged during the construction phase.

- Preparation of an Emergency Management Plan in consultation with the Country Fire Service to ensure that effective communications and response procedures are in place for the Project. In addition to addressing a range of other issues, the Emergency Management Plan will provide protocols relating to:
  - ▶ operation of the Project in the event of a fire in the Project area
  - ▶ response of Project workforce to effectively assist the response in the event of a fire in the Project area.
- Completion of a pre-construction survey of Differential GPS users in the vicinity of the Project in order to:
  - ▶ identify users of at risk of potential interference to Differential GPS services in the local area
  - ▶ identify the quality of FM reception for Differential GPS in the area
  - ▶ propose alternatives to remediate potential interference to Differential GPS services, including the installation or upgrade of local FM transmission networks used for these services.
- Consultation with the District Council of Yorke Peninsula on a number of specific issues prior to construction commencing, including:
  - ▶ establishment of Community Support Fund and criteria for funding eligibility
  - ▶ maintenance program for Council roads
  - ▶ traffic management plan and emergency and fire management plan
  - ▶ strategy for workforce accommodation

- ▶ water supply requirements
- ▶ operational management plan for wind farm
- ▶ native vegetation removal requirements and environmental offsets.
- Consultation with Salisbury Council on the converter station and cable alignment, including:
  - ▶ detailed site plans, including building dimensions and proposed materials
  - ▶ landscaping plan for the site
  - ▶ preferred cable alignment from St Kilda to converter station site
  - ▶ approach to avoid constraints identified by Council in submission dated 21 March 2013.
- Preparation of a Construction and Environmental Management Plan (CEMP) for the wind farm – the Proponent will be required to prepare a detailed CEMP prior to construction commencing to manage potential environmental impacts and detail specific management measures. In developing the Plan the contractor will need to liaise with Council regarding the development of some of these plans, including emergency and fire management, traffic management, operational management plan and the EPA regarding assumptions to be used in the development of management plans.
- Preparation of a Construction and Environmental Management Plan (CEMP) for marine cable – the Proponent will be required to prepare a detailed CEMP prior to construction commencing to manage potential impacts associated with drilling, vessel and other traffic, trenching and acid sulfate soils management.
- Development of a program for ongoing community engagement during the construction and operation of the Project.



## 6. Conclusion

The proposed development is considered appropriate for the locality given the existing land use in and around the Project area. Wind farms are compatible with traditional farming activities and are not at conflict with continued farming on the Yorke Peninsula. The Project is compatible with the existing farming practices and would have a negligible impact on the productive capacity of the farming activities in the zone within and adjacent to the wind farm.

While there is the potential for the Project to impact upon the local environment particularly during the construction phase, a range of mitigation measures have been identified to manage or mitigate these potential impacts.

The Project will create a range of economic benefits to the State as well as the local and wider Yorke Peninsula community through direct investment and jobs, and the establishment of a \$150,000 per annum community support fund to support local and regional programs and projects. On a broader scale, the Project will contribute to energy security, reduce GHG emissions, and provide a direct and efficient HVDC connection into Adelaide. The Project will be a potential enabler of other developments in the region including the nearby Rex Minerals Hillside project and a local biomass project with capacity of up to 20 MW and is expected to bring forward the National Broadband Network (NBN) service to the Yorke Peninsula, facilitating further investment in the region.

The proposed Project is not at variance with the relevant Development Plan provisions and is consistent with visual impact setback provisions in the Development Plans as well as relevant EPA Guidelines and peak industry standards with respect to noise and shadow flicker.

The proposed development, when considered on its merits, warrants the grant of development consent.



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# Appendix A

## Noise Impact Assessment



## **Appendix B**

Scope Construction and Environmental Management Plan



## **Appendix C**

Maps showing vegetation type and condition of converter station site



## **Appendix D**

CFS Fact Sheet: Understanding Aerial Firefighting



# Appendix E

Construction and Environmental Management Framework



# Appendix F

URPS Planning Assessment Report



# Appendix G

URPS Planning Assessment Review Report