Glen Innes WIND FARM

Submissions Report

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Contents

TABLES

FIGURES

APPENDICES

1. Purpose of this document

This submissions report has been prepared by Aurecon (formerly Connell Wagner) on behalf of, and in conjunction with, Glen Innes Wind Power. It provides the proponent's response to the submissions received from the public exhibition and the associated NSW government agency review of the Environmental Assessment for the proposed Glen Innes Wind Farm. The proponent's response has been sought of the proponent by the Department of Planning in its letter of 29th January 2009 (Appendix A).

It is anticipated that the proponent's review of submissions provided in this submissions report will form part of the matters considered by the NSW Department of Planning in its review of the Project Application that is assessed under Part 3A of the Environmental Planning and Assessment (EP&A) Act. As is normal practice by the Department it is expected that the submissions report will be made publicly available on the Department's web-site.

2. Background and review of the NSW planning process

2.1 The proposal

The proposed Glen Innes Wind Farm project involves the construction and operation of a wind farm comprising up to 27 wind turbines, a 33,000 volt/132,000 volt substation and associated access and electrical connection works. Each turbine would have a capacity of between 2 and 3 MW and physical dimensions involving a tower of about 80 metres height and a rotor diameter of 80 to 100 metres.

The wind farm would be connected to the proposed 132,000 TransGrid volt Glen Innes to Inverell transmission line which is expected to be upgraded to 132,000 volts from the current 66,000 volt Country Energy line.

The wind farm and the substation would be located on privately owned land for which the proponent has secured leases with the landowners for the construction and operation of the wind farm.

Access to the wind farm site will be gained from the Gwydir Highway at the northern end of the project site. The access route will follow the former Gwydir Highway within the Wattle Vale Travelling Stock Route and then continue along the spine of the Waterloo Range in a southerly direction to each of the respective wind turbine sites.

Equipment to be used has not yet been confirmed and accordingly the Environmental Assessment has considered a range of potential turbine specifications including consideration of worse case characteristics.

The construction of the wind farm and the substation could extend over about 12 months and operation would continue for an estimated 20 to 25 year life of the wind farm.

2.2 The proponent

Glen Innes Wind Power is a company formed specifically for the development of the Glen Innes Wind Farm. Its parent companies are involved with renewable power generation development and as a joint venture company (between Babcock and Brown Windpower Pty Ltd and NP Power Pty Ltd) propose the development of the Glen Innes Wind Farm.

Babcock and Brown Wind Partners has recently completed its separation from Babcock and Brown and has announced an agreement with Babcock & Brown to acquire its wind development assets,

which includes a 50% interest in Glen Innes Wind Power. NP Power continues to own the other 50% of Glen Innes Wind Power. .

As part of the separation Babcock and Brown Wind Partners has been renamed as Infigen Energy and registered on the Australian Stock Exchange under that name. Infigen Energy is a pure renewable energy business which owns and operates wind farms spanning four countries and three continents. Infigen Energy's business comprises interests in 41 wind farms that have a total installed capacity of approximately 2,246 MW and are diversified by wind resources, currency, equipment supplier, off take arrangements and regulatory regime. Infigen Energy's investment strategy is to grow security-holder wealth through efficient management of its wind energy assets.

NP Power Pty Ltd as one of two part owners of Glen Innes Wind Power is managing the design and contractual matters for the wind farm implementation. NP Power has a demonstrated record of wind farm development both in Australia and overseas.

Infigen Energy and NP Power have demonstrated an ongoing commitment to the delivery of significant renewable energy projects and are currently involved with several wind farm development sites in NSW and are operating significant wind farms in South Australia and Western Australia as well as wind farm projects outside Australia.

Glen Innes Wind Power has been investigating the development of a wind farm on the Waterloo Range since 2001. Initial stages involved preliminary investigations in regard to assessing suitability of the wind resources, identifying suitable properties and establishing access to the sites, reviewing potential for grid connection and access suitability as well as preliminary identification of environmental issues.

Three meteorological monitoring masts were established by the proponent on the site to confirm wind energy resources at the locality. A fourth mast is present in the middle of the site and was installed in the 1990s as part of the NSW government wind monitoring program originally by the Sustainable Energy Development Authority (SEDA), the role of which is now incorporated in the Department of Water and Energy (DWE).

The installation of the proponent's three masts provided a general awareness by Council and the broader community of the early wind resource investigations. They also followed the development of agreements with certain landowners whose properties provided potential wind turbine sites. The consultation with the local community has been progressed as the project details have been developed to the stage where comprehensive details of the project have now been provided in conjunction with the public exhibition of the Environmental Assessment. The local community has reviewed the documents and provided comprehensive submissions, on the proposal and the associated Environmental Assessment, which this submissions report now addresses.

2.3 NSW planning process

In early 2007, the planning process was formally initiated with a Planning Focus Meeting held in Glen Innes and a Project Application and Preliminary Environmental Assessment were lodged with the NSW Department of Planning in March 2007. The Department had previously advised that the project would be considered as a Major Project and subject to assessment under Part 3A of the Environmental Planning and Assessment (EP&A) Act, 1979. The NSW Premier has also recently advised that wind farms of over 30 MW capacity will be classified as Critical Infrastructure under Part 3A of the EP&A Act. This change is indicated to give recognition to the importance nationally and at state level to progressing renewable energy developments. It is understood that the details of this addition to activities to be considered Critical Infrastructure and various procedural aspects are still to be confirmed.

The Preliminary Environmental Assessment March 2007 was based on a wind farm comprising 22 wind turbines and a substation with grid connection at either 66,000 volts or 132,000 volts. Based on

the Preliminary Environmental Assessment and consideration of the potential issues to be considered by the approval process, the Director-General of the NSW Department of Planning issued Environmental Assessment requirements in May 2007. Preparation of the Environmental Assessment was substantially undertaken during 2007 and a draft Environmental Assessment was submitted to the Department of Planning in March 2008 with a revised Project Application.

Following an adequacy review by the Department of Planning, supported by key NSW government agencies the Environmental Assessment was amended by the proponent and subsequently accepted by the Department of Planning as being suitable to be placed on Public Exhibition.

The key stages of the formal planning process undertaken to date are shown in Table 2.1.

Table 2.1 Key stages of the planning process

Timing	Description of planning phase or event
Dec 2006	Director-General declares the proposal a project to which Part 3A of the EP&A Act applies
Jan 2007	Planning Focus Meeting held in Glen Innes and attended by key government agencies and the proponent
Mar 2007	Project Application and Preliminary Environmental Assessment lodged with Department of Planning
May 2007	Director- General's requirements for the Environmental Assessment issued
	Environmental studies completed and Environmental Assessment prepared
Mar 2008	Draft Environmental Assessment submitted to NSW Department of Planning
	Adequacy review by Department of Planning and amendment and finalisation of Environmental Assessment by proponent
Nov 2008 Dec 2008	Exhibition of Environmental Assessment. Submissions received by Department of Planning from mid December 2008 to mid January 2009
Jan 2009	Period for receipt of supplementary submissions closed and all submissions provided to proponent for review and comment provided as this submissions report
Feb 2009	Premier indicated that Wind farms > 30MW will be declared as critical infrastructure under the EP&A Act
Mar 2009	Department visits proposed wind farm site and meets selected neighbours to the site
April 2009	Submission report prepared including additional photomontages and Native Vegetation Offset Strategy.

2.4 Exhibition of the Environmental Assessment

The Environmental Assessment was placed on exhibition from 5th November 2008 to the 17th December 2008. The public exhibition period was extended from the minimum period defined in the EP&A Act of 30 days to 6 weeks by agreement between the Department and the proponent. That extension was provided to enable an extended time for review by relevant stakeholders.

The Department of Planning arranged advertising for the exhibition of the Environmental Assessment in the local print media.

The proponent also provided notification of the public exhibition to all stakeholders within 5 kilometres of the project site through mail out. Hardcopies and softcopies of the Environmental Assessment documentation were also provided direct to selected closer neighbours to the site. In addition, the

proponent arranged two Information Days in Glen Innes during the public exhibition period and held an evening meeting with the Glen Innes Landscape Guardians, in conjunction with the Information Days.

While the exhibition period closed on 17th December 2008, the Department of Planning allowed an extension of the period when it would receive submissions from concerned members of the community who had previously lodged a submission by the 17th December 2008. The extension of time was requested by the local community, agreed to by the proponent and the date of 16th January 2009 was implemented by the Department of Planning as the closing date for supplementary submissions.

Submissions received by the Department were forwarded to the proponent to provide comment on the matters raised and where appropriate clarifications. The Department in its letter of 29th January 2009 (Appendix 1) has sought a response from the proponent in respect of the respondent submissions. The respondent submissions have been reviewed by the proponent and the proponents' response to relevant matters is provided in this Submissions Report.

The Department also issued two further requests for information as indicated below.

The Department's letter of 18th March 2009 requested the proponent to provide further photomontages of the proposed wind farm taken from Highfields, Cherry Tree, Mayvona and Ilparran residences. The photomontages were required to show superimposed wind turbine towers as would be visible from the specified residences in order to better assess the visual impact of the wind farm at each of the residences. Two photomontages have been provided for each residence location and are provided in Plates 1 to 8 of Appendix D of this Submissions Report.

In addition, the Department's letter of 6th April 2009 requested the following:

- Mapping of individual vegetation communities (superimposed with the project footprint)
- Quantification of the area of each community to be impacted
- Provision of an offset strategy
- Matters raised by DECC in respect of flora and fauna and indigenous heritage be addressed in the Submissions Report
- Discussions be undertaken with DECC to ensure that information provided in the submissions report fully addresses the issues of the DECC

The above matters have been dealt with in Section 3 of this submissions report and associated appendices, particularly Appendices E and F.

2.5 Details of submissions received

Submissions were received from a total of 29 respondents being individuals or organisations. The respondents are listed in Table 2.2 and in summary the responses included:

- 19 objections – included significant submissions by Glen Innes Landscape Guardians (GILGs), the owners of the Furracabad Station properties and members of the McAlary families as well as a range of individual submissions from other members of the local community. 16 objections were from residents and friends of residents of the Furracabad Valley while one was from a property on the northern end of Waterloo Range and two were from residents of the Wellingrove Valley to the west of the wind farm site
- Two submissions related to aerial agricultural issues – from AAAA and SuperAir
- One was from Glen Innes Severn Council (GISC) as the local government authority
- Four were from NSW government agencies – DECC, DWE, RTA and RFS
- One was from a Non Government Organisation (NGO) – Nature Conservation Council (NCC)
- Two were from supporters, one from a local wind farmer property and the other from a supporter of renewable energy developments

In addition, to the respondent statements reference was also made by the respondents to articles that the respondents are relevant to the proposal and its impacts. The key articles referred to by the respondents are listed in Table 2.3 of this submissions report.

Some of the respondent submissions have involved significant preparation by specific individuals or groups of individuals and indicate the level of concern experienced by those persons. The submissions are regarded as genuine responses and deal with matters that may genuinely be of concern to the respondent.

There is considerable overlap in the issues raised by many of the submissions and it was considered reasonable for matters raised by the respondents to be dealt with in this submissions report on an issue by issue basis. The sections relating to specific issues treat the collective respondent statements on the specific issue together rather than dealing with all matters for each respondent individually.

Where submissions by respondents cover a broad range of matters, some aspects raised by the respondents could be of lesser concern to the respondent but may have been added to provide a broader platform for their objection. This submissions report does not attempt to provide interpretation of ranking of importance of the different issues for respective respondents. Some respondents have indicated that all issues are important and their concern is reflected by the sum of the matters.

Some respondents have referenced material drawn from various sources, particularly web based material. Typically such material indicates impacts from other wind energy developments that are considered by the respective respondents to support their objections. Considerable variation in site characteristics and wind farm design and equipment can mean that information from other wind farm sites is not always directly applicable to sites with different environmental and engineering characteristics or social context.

Also in respect of references to articles sourced from the internet it is noted that the quality of web-based information varies in its reliability in addressing the matters relevant to wind farm impact assessment. This submissions report also provides brief reviews of some of the material referenced by respondents to an extent deemed relevant to the particular material.

Table 2.2 – List of respondents following public exhibition of the Environmental Assessment

A	**Government agencies and NGOs (6 submissions)**	
A1	Glen Innes Severn Council (GISC)	
A2	Department of Environment and Climate Change (DECC)	
A3	Roads and Traffic Authority (RTA)	
A4	Department of Water and Energy (DWE)	
A5	Rural Fire Service (RFS)	
A6	Nature Conservation Council of NSW (NCC)	
B	**Aerial Agricultural Issues (2 submissions)**	
B1	Aerial Agricultural Association of Australia (AAAA)	
B2	David Boundy (SuperAir)	(Armidale based, active over wide area)
C	**Furracabad Valley (16 submissions)**	
C1	Ashley Peake and Suzanne	(Furracabad Valley residence at about 1.5km)
C2	Beth Winter – Mayfield	(Furracabad Valley residence >3km)
C3	Philip and Bettina Lynn (Clancy Pastoral)	(Friends of neighbouring community)
C4	Brian and Nerolie Winter (Mayfield 2)	(Furracabad Valley residence >4km)
C5	Carl and Lillian Toovey	(Furracabad Valley residence at about 4km)
C6	Daniel McAlary	(Furracabad Valley residence at about 2km)
C7	Frank McAlary	(Furracabad Valley residences at 0.85 to 2.2km)
C8	G.D.G. Bruce Carrington Park	(Furracabad Valley residence at 4 to 5kms)
C9	Geoffrey Putland and Christine	("Furracabad Station" at >3kms – 3 residences)
C10	Glen Innes Landscape Guardians (GILGs)	(Community group – primarily Furracabad Valley)
C11	John David Winter	(Resident Maryland, Sydney, family connection)
C12	Margaret Walsh	(Owns Elm Vale (3 – 4 km) and Bindanoon (5km))
C13	Patricia McAlary	(Furracabad Valley residence at about 2.5 km>)
C14	Phil Evans "Highfields"	(Furracabad Valley residence at 0.96km)
C15	Phillip and Jennifer Rhodes	(Furracabad Valley residence at about 3km)
C16	Steven and Kristin Lynn	(Furracabad Valley residence at about 4km)
D	**Wellingrove Valley (2 submissions)**	
D1	Rick Yeates "Talarook"	(Wellingrove Valley residence at >3km)
D2	Don Anderson "Waterloo Station"	(Wellingrove Valley residence at >3km)
E	**Waterloo Range (single submission)**	
E1	RG & JI Rossington – "Wattle Vale"	(Waterloo Range residence at about 1.9 km)
F	**Supporting submissions (2 submissions)**	
F1	Robert and Annabel Dalhunty "Nant Lodge"	(Wind farmer and residence at about 4km)
F2	Jaden Harris – North Curl Curl 2099	(residence in Sydney, supports renewable energy)

Table 2.3 Reference articles quoted in respondents' submissions to the Department of Planning

Author	Title	Date/website	Subject
Dr Amanda Harry	Wind turbine, noise and health	February 2007	Health
Dr Nina Pierpont MD	Wind Turbine Syndrome" – Testimony Dr Nina Pierpont MD PhD before the New York State Legislature Energy Committee	March 2006.	Health
Dr Nina Pierpont MD	Wind turbine syndrome – a report as a National Experiment	www.windturbinesyndrome.com Book to be published 2009	Health
Retoxo-RISP	Important Factors when planning a wind farm	www.retoxo.de	2km setbacks
Alan Hives	Article	National Wind Watch posted 14th November 2008	Land values
John J Jess	Article	Valuer based in Ballarat	Land values
Glen Innes Severn Council	GISC LEP – Development Control Plan Wind Farms	Glen Innes Severn Council May 2008	Setback
Auswind and Australian Council of National Trusts	"Best Practice Guidelines" Landscape Values "Foundation Report" and National Assessment Framework" report.	www.auswind.org	
Dr Nina Pierpont MD PhD.	Health, hazard and quality of life near wind power installations. How close too close?	March 2005	Health
Kamperman & James	Simple Guidelines for siting wind turbines to prevent health risks	NOISE-CON 2008.	Health
Professor John Harrison.	Disconnect between turbine noise guidelines and Health Authority recommendations	World Wind Energy Conference 2008, Canada **harrisjp@physics.queensu.ca**	Health
Noise Assoc UK	Location, Location, Location – An investigation into wind farms and noise	2006.	Health
Dr Geoff Leventhall	A review of Published Research on Low Frequency Noise and its Effects (DEFRA)	May 2003.	Health
Danny Buttley, Victoria (Australia)	Blot on the landscape	Herald Sun, 21 Feb 04: "	Land Values
Paul Sellars,	Turbines Cast Shadow Over Land Values	Weekly Times, 16 APR 2003...	Land Values
Dr Nina Pierpont MD PhD.	Health, Hazard, and Quality of Life near Wind Power Installations: How Close Is too Close?	Posted July 26th, 2008 in Articles by Nina Pierpont. (3-2-05)	Health
Dr Nina Pierpont MD PhD.	Noisy Wind and Hot Air	Posted July 26th, 2008 in Articles by Nina Pierpont.	Health
Dr Nina Pierpont MD PhD.	Health Effects of Wind Turbine Noise	Posted July 26th, 2008 in Articles by Nina Pierpont.	Health

2.6 Structure of this report

This proponent's submissions report provides a review of the issues raised by the various respondent submissions with an emphasis on key issues (Section 3.1) and their relevance for the Glen Innes Wind Farm proposal. The range of issues raised by the respondents are typical considerations for wind energy projects and have been subject to extensive review at many sites either in Australia or overseas. The respondent submissions combine reference to other wind farm projects in respect of specific matters relating to the local area and the relevance of the references varies.

Section 3 of this submissions report deals with each key issue in respect of the range of matters raised by the collective set of submissions. In some places, respondents have made assertions about inaccuracies or deficiencies in information in the Environmental Assessment and those that are considered by the proponent to be meaningful to the Department's assessment of the proposal are addressed in this document. Not every assertion made in the various submissions is specifically addressed by this Report for the following reasons:

- the matter is raised in more than one submission and is dealt with collectively in this report
- some are regarded as evidently inaccurate
- some are regarded as trivial or irrelevant to the planning process.

Where the proponent has responded to respondent statement, the respondent statements are generally shown in ***'bold/italics'*** to distinguish them from the proponent's response.

Reference to individual respondents in Section 3 use the codes shown in the left hand column of Table 2.2 as abbreviations for the full respondent name.

It is considered that this submissions report addresses all the key matters raised by the respondent submissions and enables the Department of Planning to undertake its review of the respondent submissions from the public exhibition of the Environmental Assessment in the light of the proponent's comments on the submissions.

Section 4 provides the proponents response to the respondent submissions by way of minor modifications to details of the Project Application and an amended Statement of Commitments.

This submissions report also includes Appendices A to G that contain various supporting information. The Appendices address the following matters:

Appendix A	Department of Planning correspondence (three letters seeking proponent responses)
Appendix B	Proponent's amended Statement of Commitments
Appendix C	Compilation of visual images assisting understanding of visual impact at neighbouring residences
Appendix D	Additional photomontages for four residences nominated by Department of Planning
Appendix E	Native Vegetation Offset Strategy
Appendix F	Additional Threatened Species Information
Appendix G	Previous correspondence with Aerial Agricultural stakeholders
Appendix H	Copy of email response from Glen Innes Local Aboriginal Land Council
Appendix I	GIWP Planning Update Brochure October 2008

3. KEY ISSUES RAISED BY SUBMISSIONS

3.1 Summary of key issues raised

The key issues raised by the various respondent submissions relate to the topics that are listed below and described in the following sections.

- Property description (Section 3.2)
- Visual and shadow flicker (Section 3.3)
- Noise (Section 3.4)
- Health (Section 3.5)
- Two kilometre setback and removal of up to 10 turbines (Section 3.6)
- Traffic and transport (Section 3.7)
- Biodiversity and Native Vegetation Offset Strategy (Section 3.8)
- Indigenous and non-indigenous heritage (Section 3.9)
- Soil and water management (Section 3.10)
- Bushfire (Section 3.11)
- Impacts on aerial agriculture business and farm productivity and costs (Section 3.12)
- Impact on property values (Section 3.13)
- Lack of community consultation (Section 3.14)

The proponent's response to the respondent statements is shown in the following sections.

3.2 Property Description

This section of the submissions report addresses matters raised by respondents in respect of property related aspects.

3.2.1 Land on which the project is located

Respondent (C6) statement - The submission by Mr Daniel McAlary of Lombardy has identified an error in Figure 1.5 of the Environmental Assessment that shows details of the property for the Glen Innes Wind Farm.

The proponent agrees with that particular aspect of Mr Daniel McAlary's submission and has amended the project application to correctly reflect the graphic representation of property details in relation to the project. The details of the correct project boundary are shown in Figure SR1 (modified Figure 1.5 of the Environmental Assessment). Table 1.1 of the Environmental Assessment listed the properties associated with the project and is unchanged. Table 3.1 included with this submissions report lists the properties associated with the project.

3.2.2 Additional residence near Klossie not shown in Environmental Assessment

Respondent (C6) statement - The submission by Mr Daniel McAlary of Lombardy has identified a missing residence in the Environmental Assessment.

The proponent agrees with the submission of Mr Daniel McAlary and acknowledges the oversight in relation to a green A-Frame house on the property referred to as "Klossie" and that it is not shown in the Environmental Assessment. This house is not shown on commercially available mapping and presumably is a recent addition since the maps were prepared. It is not readily visible on Google Earth images (dated June 2004) and was not seen by Aurecon from Cherry Tree Road when visiting the Klossie residence or mentioned when the Klossie residence was visited. Although the ridge top near Turbine 19 was visited by Aurecon and observations of the valley and location of neighbouring

residences were made the green A-frame house was not noted during preparation of the Environmental Assessment.

Table 3.1 - Property details for land on which the wind farm is located

Property or Landowner	Land Title Details		Turbine / Mast Numbers	No. of turbines	
	DP	Lot			
Rural Lands Protection Board	Wattle Vale Travelling Stock Route (TSR) 67474 including the former Gwydir Highway alignment		Site access and grid connection		
R & E Sheedy	753274	72	Substation only		
	753274	89	Nil	0	9
	753319	Pt 90	1, 3, 5, **M1**	3	
	753319	86	2, 4	2	
	753319	105	6, 7	2	
	562615	2	8, 9	2	
Telstra	562615	1 Telecommunications Facility - Not part of the proposal Associated with an easement for access to site from Rose Hill Road			
Nant Pastoral	1096761	1	10, 20B, 21B & 22B, **M2**	4	5
	508195	2	Nil	0	
	753270	116, 118	Nil	0	
	508196	2	10B	1	
J Bower	1004132	1332	11, 11B, 12B & 12C, **M4**	4	
D Hartmann	1004132	1331	13, 13B, 14B	3	
Allan Fletcher	753270	117	Access only		
	596311	2	15, 16B & 16C, 17, 18,19, **M3**	6	
		Total number of turbines		**27**	
M1 to M3 are the proponent's existing meteorological monitoring masts and may be retained as permanent masts.M4 is owned by the DWE, is not part of the project and will need to be removed before construction of Turbine 12B.					

Following receipt of the submission by Mr McAlary a review of the available photography obtained from Waterloo Range near Turbine site 19 was undertaken. That review did reveal a house near the location indicated by Mr Daniel McAlary. It was difficult to identify in the relevant photograph due to its colour and position amongst mature trees. During a visit to the site on 25/6/09 the Green House was observed to the west of Klossie. The approximate house location is shown in Figure SR2 (modified Figure 10.1 of the Environmental Assessment) and an aerial view is provided in Appendix C11. It is indicated to be generally vacant but also indicated by Mr McAlary that it can be used as a weekender.

3.2.3 'Oakes' residence should be 'Green Valley'

Respondent (C9) statement - The submission by Geoffrey W Putland and Christine VA Thompson stated that the "Oakes" property had been incorrectly named and should be referred to as "Green Valley"

Aurecon had referred to a residence in Wellingrove Valley as the "Oakes' residence as it had been referred to by that name, by Wellingrove Valley residents and accordingly was shown on figures in the Environmental Assessment as "Oakes". However, Mr Putland and Christine Thompson, the owners of Furracabad Station have since advised in their submission that Mr Oakes formerly occupied the residence in the capacity of property manager for the Furracabad Station properties and the residence

is now occupied by Furracabad Station's Cattle Manager and his family. Its status in terms of the assessment remains unchanged as a neighbouring residence. It is noted that the residence could not be seen from a position on the ridge-top near Turbines 16B and 16C. The lack of visibility is assumed to be due to tree screening located near the residence as indicated in Appendix C7. Nevertheless it is possible that more elevated parts of some turbines may be seen from "Green Valley" residence over a narrow view field angle. The name of the residence has been added to the Figure SR2. The Putland submission also notes the presence of another house on the property but no details were provided in the submission.

An additional residence known as Furracabad cottage is located about one kilometre south of Furracabad Station and has been added to Figure SR2. It is about four kilometres from the wind farm.

The Putland submission notes that there are 2 other houses on the Furracabad Station homestead block, collectively three houses being located at this location. As the three residences are close together the impact will be similar for each of them although they may have slightly different outlooks including directions other than towards the wind farm. The three houses are within an area of close spaced trees that partly screens them from surrounding roads and which are likely to limit their outlook in some directions (Appendix C6).

3.2.4 Moonarie residence incorrectly shown in Environmental Assessment

The Moonarie residence is incorrectly shown in the Environmental Assessment as being the residence at 937 Furracabad Road. The residence at 937 Furracabad Road is owned by Phillip and Jennifer Rhodes and has been referred to as Lecole Pas in the Glen Innes Landscape Guardians submission.

Following on from the above, the two residences labelled as Nevada Park are taken to be Moonarie (near the corner of Haymarket Road and Furracabad Road) and the recently constructed residence fronting on to Haymarket Road and being slightly to the south of Moonarie. The labelling of these residences has been accordingly modified in the graphics supplied in this submissions report (Figure SR2). These three residences are at or beyond three kilometres from the wind farm and within close proximity to each other. A photomontage was prepared for a viewpoint very close to the three residences at the intersection of Haymarket and Furracabad Roads.

3.2.5 Grid connection

The substation is proposed to be located on the wind farm site to the east of Turbine 1. This location is very close to the existing 66,000 volt Country Energy transmission line that is expected to be upgraded to 132,000 volt by TransGrid. It is expected that TransGrid will own the proposed 132,000 volt switchyard and the short section of 132,000 volt overhead line that will be required to form the grid connection between the substation and the Glen Innes to Inverell 132,000 volt transmission line. The point of connection to the new 132,000 volt line will be within the line easement that may be within the Wattlevale Travelling Stock Route or on land leased for the wind farm.

3.2.6 Conclusions in respect of property aspects

This submissions report clarifies a number of matters in respect of the property associated with the project and the identification and naming of properties or residences surrounding the wind farm site. Figure SR1 shows the corrected extent of lands forming part of the lands leased for the project. The change excludes a small area of land that had inadvertently been included in Figure 1.5 of the Environmental Assessment. The exclusion of the lot does not impact the project description or listing of land titles that had been shown in the Environmental Assessment.

The change to naming of residences provides clarification of neighbouring property details but does not result in significant change to the findings of the Environmental Assessment and Statement of Commitments.

3.3 Visual impact

A review of the visual aspects raised by the various respondent submissions is provided in the following sections. The matters raised by the respondent statements have been grouped into the following sub-sections according to the specific matters listed below.

- Glen Innes Severn DCP – Wind power generation
- Furracabad Valley landscape and industrialisation of the landscape
- Wellingrove Valley landscape
- Visibility assessment process and Director-General's assessment requirements
- Social acceptability of the wind farm and its visual impact
- Visual prominence versus visual dominance
- Consultation and landscape values
- Shadow flicker
- Photomontage sites do not include neighbouring residences
- Provision of additional photomontages
- Conclusions in relation to responses relating to visual impact

3.3.1 Glen Innes Severn Council DCP – Wind Power Generation

***Respondent (A1) statement* – The Glen Innes Severn DCP – Wind Power Generation includes requirements in relation to visual impact assessment.**

The Development Control Plan (DCP) was developed during the period that the Environmental Assessment was being prepared. The DCP became effective from 28th May 2008 which was after the submission of the Environmental Assessment to the Department of Planning, which occurred in March 2008. The guidance for the Environmental Assessment was the Director-General's requirements that were issued in May 2007 under Part 3A of the EP&A Act. While the DCP is not directly applicable to the process undertaken for the Glen Innes Wind Farm, many of the requirements in relation to visual impact assessment have been addressed by the Environmental Assessment. Specific matters relating to visual impact mainly in relation to comments from the local community's responses are discussed in the following sections.

3.3.2 Furracabad Valley landscape and industrialisation of the landscape

Respondent (C1) statement – We love the visual quality of the Furracabad Valley with its pastoral vistas and ridges of rounded hills with remnant woodland. The imposition of 130 metre industrial wind turbines on these ridges will radically change its rural nature. Almost as high as the ridges they are perched on, these turbines are about the same height as a 40 storey building and will dominate the landscape.

Respondent (C1) statement – Although the valley is significantly cleared and altered by farming practice it is however "natural". The joy of being part of a natural environment, as in watching a sunset, is the big reason for living "in the bush" and this will be forever altered to an industrial landscape.

The respondent's appreciation of the existing landscape is understood. While the wind farm does introduce new elements into the landscape, the respondent's view that the project will radically change the rural nature of the location is considered an extreme view. Comparison of turbines to 40 storey buildings overlooks the much different bulk in the two structures and exaggerates the impact. The proponent is aware of many wind farms that have been introduced to rural landscapes that appear well accepted by local communities and where the bulk of the rural landscape character is still apparent.

For many of the residents surrounding the wind farm, the viewfield occupied by the wind farm will only constitute part of their range of views. Figure SR4 provides an indication of the viewfield angle for

respondent C1 (about 112 degrees) and the number of turbines in the immediate vicinity of this residence. There turbine sites are within two kilometres of the C1 residence and the closest is at 1.6 kilometres. A further seven turbine sites are at a distance of 2 to 3 kilometres. The C1 residence location may also have views to turbines on the western ridge however these are not within the viewfield of living areas for the residence. Photomontages have been prepared for viewpoints at the C1 residence and are included as Plate 3 and 4. Appendix C2 also provides representative photos from the C1 residence.

Sunsets are still likely to offer the inherent beauty despite the presence of one or more turbines in parts of some views of the sunset. Section 3.3.11 addresses the issue of visual prominence and dominance.

Respondent (C5) statement – The visual impact of extensive and extremely high man made structures erected along the western ridge lines of the valley, thereby altering the natural landscape which residents of the valley admire and pride. Once the wind farm turbines have been erected the valley will be changed and look more industrial than the now natural inspiring outlook.

The proponent acknowledges that the respondent appreciates the rural environment in its current form but the suggestion that the local landscapes will be forever altered to an industrial landscape is considered to diminish the significant part that rural elements will occupy in the views from the respondent's location and exaggerate the extent of the changes associated with the wind farm development. The respondent will be about 4 kilometres from the proposed wind farm and is understood to have mature trees at the homestead that will provide some visual screening.

Respondent (C6) statement - The four towers 10, 20B, 21B & 22B on Dulhunty and the two towers 18 & 19 are essentially branches of the main line of wind towers and project into the valley and so adversely affect residences. In respect of the visual I point out that they are 130 metres high and that they are to be placed on ridges generally speaking about 150 metres higher than the valley floor. In such a location they will dominate the landscape from south west to north-west.

The respondent identifies six turbines as being of concern and these are elevated above the Furracabad Valley. The community in that area is able to gauge the height of the structures by the meteorological masts that have been installed on the ridges near to proposed turbine sites. The top of the 80 metre masts is the same as the proposed turbine hub height. The Environmental Assessment has indicated that the wind turbine structures will be prominent and that some viewers will find this an adverse impact, however that is not the view of all persons. As the implementation of further amounts of wind energy is undertaken, wind turbines will become more common features of rural landscapes and this has already happened at many other sites throughout the world. Taken in perspective the installation of six turbines on the immediate ridges to the west of the respondent's properties is a relatively small number of structures compared to other wind farms that have been developed and the proportion of the viewfield affected by the wind farm for the residences is only part of the overall viewfield for the various residences.

The respondent will have a viewfield of part of the proposed wind farm comprising about 90° from the south west to the northwest as indicated in the Environmental Assessment. The base of the closest turbine, 22B is 155 metres above the residence at a distance of 1.9 kilometres. This creates a 7° elevation angle from the residence to the hub of Turbine 22B, as described in Appendix C of the Environmental Assessment.

This being the case, strategic tree planting could be used to screen the turbines and reduce the visual impact on the residence. As demonstrated in the images in the respondent's submission, there is already extensive screening on the western side of the residence which effectively filters the view of the wind farm (refer to Appendix C5).

Respondent (C8) statement – The visual impact they will have on the general area and the visibility of them from our home and property. We did not buy "Carrington Park" to look at the turbines but rather the nice landscape.

The respondent's appreciation of the existing landscape is understood, however, the Carrington Park residence is about 4 to 5 kilometres from the nearest wind turbines. Much of the Carrington Park viewfield will not be affected by the wind farm development. Additionally, when viewed from East Furracabad Road it appears that the Carrington Park residence has many large trees that may provide significant screening.

Respondent (C9) statement - The proposed wind farm will introduce 130 metre high industrial turbines into a rural landscape radically changing it. The turbines of Dulhunty and Fletcher are very close to residences and will dominate them because of their elevated position on ridges and virtually surround them.

Due to topography, tree screening and a small viewfield angle Furracabad Station will have limited views of the wind farm. WindFarmer analysis shows that 7 turbine hubs may be visible from the homestead, with the tips of a further 5 turbines visible. This does not consider the substantive vegetation screening at Furracabad Station. As shown in Appendix C6, Furracabad Station has extensive screening around the residences, which at a distance of 3.1 kilometres could effectively screen potentially visible turbines. Views to Furracabad residences from surrounding roads indicate that the unimpeded outlook from the respective residences is not toward the wind farm.

In regards to the Green Valley (Oakes) residence that is part of the Furracabad Station property, the visual impact is considered to be low to moderate as discussed in the Environmental Assessment. The elevation angle from the residence to the hub of the closest turbine is 8°. The residence was not seen from ground level near turbine site 16C. At a distance of 2.5 kilometres with a small viewfield angle and existing tree screening (as shown in Appendix C7) the visual impact is reduced. The proponent is prepared to assist neighbours to the wind farm with planting of trees for visual screening should they wish to screen views of the wind farm from their residence location.

Respondent (C9) statement - The authors of the Environmental Assessment and the developers have significantly downplayed the rural visual amenity of the Furracabad Valley. The Environmental Assessment implies that the Glen Innes farming area may have some "degree of attractiveness, (false - it has a high degree of attractiveness) even where it is subject to overgrazing (false – no overgrazing) and can exhibit character and beauty for some viewers."(False - All viewers). (Vol 2; Appendix C; Page 14, first sentence, last paragraph).

The proponent does not disagree that the local community may associate a high degree of attractiveness to the Furracabad locality as would be the case for residents in many rural areas throughout the New England area. However the local scenes do not appear to have gained recognition in the New England area as outstanding on a regional scale. The reference to overgrazing was taken from an article sighted at the Glen Innes Agricultural Station.

Respondent (C9) statement - Vol 2; Appendix C; 7.3.6 The Waterloo Range – last paragraph. "**As the Waterloo Range is a common landscape element within the Glen Innes–Severn region and the wider New England region the sensitivity to the visual impact from the wind farm is viewed as low." – *The conclusion for the reason stated is HIGH not low.***

The assessment of sensitivity was based on a region wide consideration of the importance of the local area and the proponent is unaware of any regional classification of the wind farm locality as being of outstanding visual significance that warranted protection under specific landscape classification. Furthermore many elements of the existing scenes will still be evident despite the introduction of wind turbines at various locations.

Respondent (C9) statement - We believe our rural views are some of the most beautiful rural views available. The developer has downplayed the rural amenity of the Valley. It has ignored the fact that the Valley would be changed from a pastoral landscape to a rural industrial landscape, as well as the associated loss of amenity and the valley's sensitivity to that loss. We don't believe that the above quoted sections represent a fair evaluation of the area as they have simply dismissed it.

The proponent acknowledges that the rural area that adjoins the wind farm site has scenic value and attractiveness. However, this appears to be the case for most Australian wind farm sites located on elevated areas. The approved Capital Wind Farm adjacent Lake George is currently under construction and is located on ridges above Lake George. This location clearly has significant scenic value and is viewed by a much greater number of people than is the case for the Furracabad Valley. Despite the scenic value and the large viewing population the project has been granted approval. With over 60 turbines now erected there does not appear to be a significant concern about the visual impact. Indeed most comments by people that have seen the erected turbines seem to regard the vista provided as one of interest rather than an adverse impact.

Respondent (C10) Statement – The respondent indicates that the Environmental Assessment concludes that many neighbouring residences will have significant visual impact from this proposed wind farm. The proposed wind farm will introduce 130 metre high industrial turbines into a rural landscape radically changing it. The turbines proposed, particularly those at the southern end, are very close to residences and will dominate them because of their elevated position on ridges and virtually surround them.

The Environmental Assessment acknowledges that the turbines will be prominent but due to their slender form and the modest scale of the development they will not dominate the collective views from most locations. Significant viewfields without turbines will still be present for many locations. The issue of dominance is discussed further in Section 3.3.11.

Respondent (C12) statement – Furracabad is a peaceful, picturesque valley where I have lived for almost 40 years. During that time, I my family and friends have enjoyed a magnificent view over the valley from my home on the Haymarket Road. At present I can see both wind monitoring towers from my front veranda. If this proposal goes ahead the wind towers will dominate the skyline and ruin the enjoyment I have had in my home and lifestyle. The massive towers (80m high) are an industrial imposition on a rural village.

The respondent's appreciation of the existing landscape is understood. Of the two respondent's properties, Elm Vale is the closest to the proposed wind farm. At 2.9 kilometres from the closest turbine the elevation angle to the hub is 5°. Selective tree planting would effectively screen the visible turbines from the residence (13 hubs with an additional 10 turbine tips over a viewfield angle of 84 degrees). The proponent is prepared to assist neighbours to the wind farm with planting should they wish to screen views of the wind farm from their residence location.

The Bindanoon property is about 4.7 kilometres from the nearest turbine and the visual impact on the property is considerably diminished. With an elevation angle of 2.7° to the turbine hubs, selective tree screening to the west of the property will be effective should the landowner wish to screen out views of the wind turbines. .

Respondent (C14) statement – As we are the closest home to the proposed wind farm, we will experience the visual amenity every waking moment. From the drive to work, the drive home from work; gardening; managing the property; to sitting in our kitchen having a cup of tea. We will be unable to escape the visual impact of this proposed wind farm.

The turbines will be visible to the respondent when coming and going from their property and from vantage points on the property. The Proponent acknowledges the high potential for visual impact at

this residence as expressed in the Environmental Assessment. The established trees to the west of the residence (as shown in Appendix C1 and Plates 1 and 2) will assist in the screening of turbines. Some existing mature trees close to the residence will screen views to turbines and further strategic plantings could provide additional screening. Should the respondent request it the proponent would undertake an assessment at the property to determine an arrangement of effective screening and would assist its implementation.

The viewfield angle (136 degrees) and proximity of turbines is illustrated in Figure SR3. There are eight turbine sites within two kilometres of the Highfields residence with the closest turbine at 0.96 kilometres.

Respondent (C14) statement – We will be surrounded by 14 x 130 metre towers. How does one escape that? The developers say in their Environmental Assessment that "The wind farm will introduce large wind turbine structures along Waterloo Range that contrast with the existing landscape. Due to the turbines being located on top of the ridgelines they will have potential to attract attention but will not obscure views of the existing rural landscape features. Viewer's opinions of the visual impact of the turbines in the landscape will vary widely and are likely to be influenced by subjective factors that are difficult to quantify." Chapter 6-1, Volume I. The quantifying factor is this, if you are surrounded by 14 x 130 metre towers this has a severe visual impact particularly when you have invested in an area because of its intrinsic natural beauty.

It should be noted that Highfields will not be surrounded by turbines. The viewfield angle to the proposed turbines from the residence is 136°, which leaves a 224° view of the valley without turbines as demonstrated in Figure SR 3. The main outlook from the home is to the north east away from the wind farm. Additionally there are established trees on the southern and western sides of the property which will assist in screening the view to some of the turbines. Further tree planting can be provided by the proponent if requested by the landowner. Plates 1 and 2 of Appendix D show the extent of wind farm visibility from the residence location and the significant screening provided by mature trees.

Respondent (C15) statement - Other effects these towers must have on the local environment, will be apart from the obvious visual effect, given they are twice the height of existing farms most people are conversant with on other areas of the state such as Blayney and Crookwell…..

Blayney and Crookwell wind farms are of a smaller scale with a turbine hub height of 45metres. The turbines proposed for Glen Innes would have a hub height of about 80 metres. This is more in line with what is currently being installed at Capital Wind Farm. Despite the scenic value and the large viewing population of the Capital Wind Farm project, there does not appear to be a significant concern about the visual impact. Indeed most comments by people that have seen the erected turbines seem to regard the vista provided as one of interest rather than an adverse impact.

Respondent (C16) statement – The visual impact of the Wind Farm will ruin our view from our house and affect our enjoyment of our property. This property has been owned by our family since 1972 and we didn't ever anticipate that our rural lifestyle would be affected by an industrial view.

See proponent's comments above regarding the "industrial view".

The respondent is 3.8 kilometres from the closest turbine (Turbine 19). Analysis using WindFarmer software shows that the residence will have a view to 12 turbine hubs and the tips of 5 turbines. This could be reduced by tree screening if requested by the landowners. Viewpoint 9 in the Environmental Assessment was taken adjacent to the Corra Lynne property and is representative of the view to the proposed wind farm from the residence.

3.3.3 Wellingrove Valley landscape

Respondent (D1) statement – We wish to lodge an objection to the proposed Glen Innes Wind Farm on the basis of a significant loss of visual amenity. In addition to its productive capacity, the property was primarily acquired for its aesthetic appeal. The homestead (Talarook) and the majority of the property has a north-easterly aspect overlooking the Wellingrove Valley, taking in the majority of the Waterloo Range.

The proponent recognises that the respondent will have a view to the proposed wind farm along the Waterloo Range but at a minimum distance of 3.6 kilometres to the closest turbine the visual impact is moderated. The respondent will still have views of the range of aspects of the rural environment that they currently appreciate and views to parts of the range that are not affected by turbines. Where turbines are positioned they will appear above the existing landscape scenes and will not mask these features. The rural elements will form a large part of their outlook and the extent of the changes associated with the wind farm development is not considered to degrade the aesthetic appeal of the existing rural elements. Representative photos illustrating factors affecting the visual aspect from respondent D1's residence are provided in Appendix C13.

Respondent (D2) statement - The visual impact of the proposal on the surrounding landscape is both significant, and deleterious to a picturesque area of the New England Tablelands.

Respondent D2 statement is in respect of Waterloo Station. Waterloo Station has been assessed as being about 3.6 kilometres from the nearest turbine with the wind farm occupying a viewfield of 60 degrees, 27 turbines being fully or partly visible and with a visibility rating of 'moderate'. While the residence has not been visited there is an indication of tree screening at this location which may reduce or filter the wind farm visibility as illustrated in Appendix C8. The respondent's comment is noted but if wind farm projects avoided pleasant rural areas that have aesthetic value there would be very few suitable sites available for this form of renewable energy and less potential to diversify the available means of electricity generation to include more sustainable forms of generation.

3.3.4 Tree screening and removal of turbines

Respondent (C1) statement – Tree screening is suggested to reduce the visual impact but this is impractical because of the height of the turbines and the ridge. In addition planting would be required on the north and northwest aspects which would limit our exposure to the winter sun so important in the passive heating of our energy efficient house.

A number of the respondents have dismissed the planting of trees to mitigate the visual impact of the wind farm because where this occurs on the north and northwest aspects it would limit exposure to winter sun. The proponent does not disagree with the respondent's statement and notes that despite the position being taken by the respondents, many residences at the general locality appear to be surrounded by mature trees including on the north and northwest side of the residences.

Despite the respondents' belief that tree screening would not be effective due to the height of the turbines and ridges, analysis shows that 10 -15 metre high trees situated 30 – 50 metres from the Cherry Tree residence would screen the turbines. Plate 3 (Appendix D) shows moderate size trees at the left and right side of the photomontage that are able to screen turbines if they were located between the turbines and the viewpoint.

Respondent (C1) statement – The solution to the problem of high visual impact at our and our neighbours' homes can be found in Vol 1 Ch.6 p.13 of the Environmental Assessment. "The proponent is unable to significantly mitigate the visibility of the wind farm by measures at the site without removing significant parts of the wind farm array." So just move them! There are other sites for these problem turbines and the original wind farm proposal was planned and viable at 22 not 27 turbines. We did offer to assist the proponents in finding a constructive way forward in a letter from the Landscape Guardians in July 2008 but this was unanswered.

The visual impact assessment correctly states the limitations with trying to screen the wind turbines at the turbine sites. As such the offer of tree planting at residences is the main option that can be offered to neighbours concerned about the visual impact. Were the project to approved in the form proposed in the Environmental Assessment then the proponent is prepared to assist neighbours to the wind farm with planting should they wish to screen views of the wind farm from their residence location.

The amended form of the project now including 27 turbine sites does not change the original envelope of the wind farm that initially involved 22 turbine sites. The proponent has considered variations to the proposed layout and the form shown in the Environmental Assessment is the maximum development that would apply.

Respondent (C6) statement – Related to this (previous) point is the presentation of long distance photos of various residences showing they are "screened" from the towers by trees. There are two problems with this approach first, particularly as it relates to Lombardy much of the screening is by deciduous trees which screen little from April to October. Secondly, many of the evergreen trees around the Lombardy house are reaching the end of their lives. The lower branches are falling off as the enclosed pictures show. These gaps in the tree screens are not noticeable shown due to the lack of focus in photos taken of the residence at a kilometre or more from elevated positions which are what are included in the Environmental Assessment. Those photos are very poor quality.

The proponent acknowledges the points made by the respondent and has compiled attachments to this report that provide more information on the visual characteristics of viewpoints at the respondent's residence location and other residences surrounding the wind farm site. These assist in demonstrating factors that will influence the extent of visual impact at respective neighbour residence locations. Appendix C5 refers to the Lombardy residence.

Additionally, if the neighbour is concerned about the existing trees dying it would be possible to replace them with that same species or perhaps a native species of the respondent's choice. The proponent is prepared to assist in this regard if requested to do so.

Respondent (C6) statement – In relation to Lombardy the Environmental Assessment states "extensive screening by large trees". This literally is true but it omits to mention that many of the trees are deciduous and the screening is much reduced in winter, Neither does the report state that other evergreens are reaching the end of their lives, losing and dropping their lower branches and not screening the towers. The photos show these problems.

The respondent in respect of Lombardy has provided photos from the residence that complement those used in the Environmental Assessment. Appendix C5 also includes compilation of the various images and includes a 'Google Earth' view that indicates the locations of trees relative to the Lombardy residence.

Respondent (C6) statement - Similarly with Mayvona the Environmental Assessment refers to some tree screening there are three trees, one is an old box tree which is almost dead the photo shows its advance deterioration. The others are small tree or large shrubs also ending their useful lives.

As for the Lombardy residence, the respondent has provided images taken from the Mayvona residence site. These have been included in Appendix C3 showing the situation for this location. Should the Mayvona residence be rebuilt and become occupied the proponent would, if requested undertake an assessment at the property to determine an arrangement of effective screening of the wind farm. Photomontages have been prepared from this location as illustrated in Plates 5 and 6. Figure SR5 shows the viewfield angle from this residence.

Respondent (C9) statement - The Environmental Assessment's recommended visual mitigation measures of "tree planting" to reduce visual impact cannot be taken seriously as it will be completely ineffective for a number of reasons:

1. ***20 metre trees will take many years to grow, so what is the measure in intervening years?***
2. ***This area is a cool climate relying heavily on northern aspects to warm homes in the winter and minimise energy use, trees on northern aspects are not an option.***
3. ***The lack of winter sun by a northerly barrier destroys the possibility of solar panels as an alternative energy source.***
4. ***Affected residents are expected to tend these trees until maturity.***
5. ***The important aspect is the landscape view itself; the trees will block it out.***

While a number of submissions have raised the issue of the inappropriateness of tree screening due to such reasons as shading of residences this seems to contrast with the general appearance of many residence sites that have a fair degree of trees placed around the residence. Discussions with landowners in areas with high wind resource often indicate that tree screening is used to shelter residences from strong winds that are common in such areas.

As shown in Appendix C6 the respondent's residence at Furracabad Station has significant tree screening in most directions. Observations from roads surrounding Furracabad Station indicate that the residences at that location appear to only have outlooks to the north east and east with filtered views to the south and such outlooks are away from the wind farm.

Respondent (C9) statement - The Environmental Assessment states the only true means of mitigation is to remove turbines. Therefore, we recommend this as the only course of action and it should have been recommended in the Environmental Assessment.

The proponent acknowledges in the Environmental Assessment the scale of the turbines and that there are no measures that can be used at the individual turbine sites to screen these structures. Accordingly apart from removing turbines it is only possible to place screening at residence sites. Should the proposed array be approved then the proponent would assist neighbours with screening of the wind farm if that were the neighbour's wish.

Respondent (C14) statement – The Environmental Assessment does rate our visual impact as "High" (Table 6.2, Chapter 6-9). It also states that we have mature trees however these trees are NOT 130metres tall, nor do they sit on the ridge and they do not surround our house. By the time these trees are tall enough to screen the wind towers, we will be dead.

The term 'High' used in the Visual Impact Assessment is assigned without reference to the effect of tree screening. Plates 1 and 2 (Appendix D) indicate the significant screening provided by nature trees.

The trees do not have to be 130 metres tall to screen the turbines at the respondent's residence. As described in the Environmental Assessment the elevation angle from the Highfields to the closest turbine hub is 12 degrees which means that 15-20 metre tall trees situated 30 – 50 metres from the residence will screen the turbines from view. From the north-west corner of the Highfields residence the M2 monitoring mast is well concealed by an existing mature tree and even the top of the T22B turbine rotor would be screened from the north western corner of the residence.

Two examples of the effectiveness of screening using trees are discussed below. The first is an example taken from a kitchen window along a wind farm array in South Australia. As can be seen near the centre of the montage, a single small shrub can be effective in shielding from view Vesta V90 3MW

turbines of 80 metre hub height. It is recognised that the terrain shown in the montage differs to the terrain of the proposed Glen Innes Wind Farm, however, a tree such as that seen on the right side of the montage is capable of screening more elevated turbines.

Example for South Australian wind farm showing screening of Vestas V90 3MW turbines by a small shrub.

The screening potential of trees is further illustrated in a second example as shown in Appendix C5. The photomontages produced by Mr Daniel McAlary for the Lombardy properties are shown in Appendix C5. As shown, the trees surrounding the Lombardy property are capable of screening 130 metre tall turbines situated on elevated ridges. Mr McAlary's montages appear to be generally representative of the scale of the turbines.

Respondent (C14) statement – The absurdity of growing large trees on the northern side of any home in the New England area shows the ignorance and lack of understanding of the proponents. We need sun in our homes so that unnecessary energy is not being used to heat our homes in what is a bitter climate. As the proponents would be aware of "Basix" regulations now ensuring that new homes meet energy targets.

The views from the Highfields residence toward the wind farm site are not to the north but the north-west, west and south west as demonstrated in Figure SR3. The main area where additional screening could be applied appears to be the south west direction screening Turbine 18 and to the west for Turbines 15 – 17 although a degree of screening is already evident for these turbines as illustrated in Plates 1 and 2. The respondent already has mature trees close to the north wester corner of the residence that will screen up to four turbines located on that direction.

3.3.5 Furracabad Valley and degraded landscape

Respondent (C6) statement – Incorrectly labels the Furracabad Valley as a "degraded" natural landscape, makes no reference to the 100,000 native trees and shrub plantings by the Furracabad Landcare Group over a period of 20 years and failed to contact the Furracabad Landcare Group in the development of the Environmental Assessment.

The Furracabad Valley is not a degraded Native Environment. Suggestions of Aurecon to the effect that the environment of the Furracabad is degraded is a biased value judgement and indicates a lack of knowledge of past government policy, bias towards uneconomically sustainable but fashionable environmentalism, and total disregard or ignorance of the activities of the Furracabad Landcare Group.

The Environmental Assessment used a reference that was available at the Glen Innes Agricultural Research Station which described the Furracabad Valley as degraded. As the report was dated it is assumed that substantive planting may have been done since the report was prepared and possibly in response to findings of the report. Despite the plantings indicated to have been done, the valley still has limited areas of native woodland vegetation. Nevertheless, it is the proponent's view that the respondent is to be congratulated for being part of the Landcare Group that has assisted with the improvement of the local environment through the indicated native tree plantings.

Respondent (C6) statement – Erection of the wind towers in the manner suggested particularly the towers 18 & 19 and 10, 20B 21B and 22B will destroy the amenity and scenic beauty of the area

The proponent does not agree with this statement and expects that if the wind farm is installed, very little of the existing native vegetation or exotic pasture will be impacted and the landscape will still include the elements that the bulk of the local community currently enjoy in the local environment. It is possible that some members of the local community will even appreciate the wind turbines as a symbol of a sustainable energy future that seeks to reduce reliance on fossil fuels by providing access to the renewable energy resource available in the local area.

Respondent (C6) statement – An environment degraded by wind turbines is not one which is conducive to continued native tree plantings.

At other sites where wind turbines have been installed the interest in planting of native trees does not appear to have been abated. It is the proponent's view that both the planting of native trees and development of renewable energy projects are seen as pursuits that are consistent with progression towards a more sustainable future. It is expected that a landowner that is genuinely interested in increasing native tree plantings to achieve Landcare objectives would still see the value in this pursuit even with wind turbines on neighbouring lands.

Respondent (C9) statement - They have also described it as <u>degraded</u> due to the clearing mentality of farmers from bygone eras. This is FALSE – it is some of the most expensive and productive land in Australia.

The proponent does not disagree that the land has a high value and notes that it is an area of moderate rainfall which together with good soils associated with basalt lithologies on the ridges would combine to make the area a fertile and productive rural region. The development of the wind farm will not limit the productive capacity of the land. The reference to degraded land was based on a report viewed at the Glen Innes Agricultural Research Station and the report is likely to have initiated improved practices for the locality. It is true that the valley floor has been extensively cleared relative to the slopes on the ridges.

Respondent (C9) statement – However the clearing of the valley, as well as the replanting of many beautiful trees including rows of poplars, oak trees, Elms, Cyprus and other exotics, as well as the plantings of native gum trees to provide nature corridors for the native wildlife, now make for some of the loveliest vistas in New South Wales. Views for which the New England area is famous.

The respondent appears to indicate in their statement that the transformation of the locality from its natural form with clearing of land and planting of the indicated exotic species has enhanced the landscape. Such transformation with the introduction of exotics appears inconsistent with generally applied Land Care principles at many other locations throughout NSW. The respondent also indicates that the New England is famous for such views and from that statement it could be taken that such vistas are common in the region and the Furracabad Valley does not rate a characteristic of uniqueness for which protection may sometimes be afforded.

3.3.6 Visibility assessment process and DGs Assessment Requirements

Some of the comments in the respondent submissions have challenged the assessment of visibility of the wind farm from the various residences surrounding the wind farm. These comments are discussed below.

Respondent (C6) submission - The proponent has scheduled in Table 7.2 'indicative visibility for viewpoints from neighbouring residents'. The schedule only nominates the closest turbine to the residence. This is sloppy, a house might be affected by several wind towers and the cumulative affect of two, three or four wind towers is greater.

The Environmental Assessment provides a schedule of the number of towers within specific distance ranges from viewpoints, in addition to the total number of turbines visible from each residence. Also included are photos of the setting of the neighbouring residences. Appendix C and D of this submission report provide additional material enabling consideration of factors that may affect the visual impact at specific neighbouring residences. Figures SR 3 – 7 provide further graphic information for the closest neighbouring residences in regards to proximity of turbines to the residences in a form that appears preferred by the respondent.

Respondent (C9) statement - Vol. 2; Appendix A; Page 3 – Director-General's Requirements. The Director General requires that **"The Environmental Assessment must assess the visual impact of the proposal on this landscape (including existing and approved dwellings) for a distance of at least 10 kilometres from the turbines, taking into consideration the impact of shadow "flicker" and blade "glint", and having particular regard to the communities of Glen Innes and Furracabad Valley".**

However, the Environmental Assessment does not address issues out to 10 kilometres. Their only acknowledgement of this is photomontage 10, which is from a distance looking from Martins Lookout Glen Innes looking west. (Vol 2; Appendix C; Viewpoint 10.) Maps also show the 10 kilometre distance mark, however no analysis occurs. They have focused on the visual impact from surrounding locality views (not homes) generally 2-3 kilometres away. It is the homes within the 2km range that have the most negative impact.

The proponent has assessed visual impact out to ten kilometres distance through two methods, namely preparation of a viewfield analysis and provision of the photomontage for the Glen Innes site of Martins lookout at slightly beyond 10 kilometres. Only one photomontage was prepared at this distance because the actual impact is in fact low and for many sites at lower elevations within Glen Innes there will be limited views to the wind farm. The visual impact from more distant viewpoints is regarded as being less significant. Additionally topography limits the viewfield in the other direction and in some directions settlement is very low.

It is noted that all residences within 3 kilometres have been assessed to determine the visibility and potential visual impact of the wind farm.

Respondent (C9) statement - The next paragraph goes on to say that "(the wind farm) will be partly concealed by topography and/or woodland." We find this a most extraordinary statement given that the turbines are 130 metres high and positioned on top of the range. It would appear that the Consultants are using a generalized template and have, once again forgotten to take out the comments that clearly don't relate to this proposed development.

The respondent's main residence is Furracabad Station within the southern part of Furracabad Valley and about three kilometres from the nearest turbine (T19). An assessment of the visibility of the wind farm from the Furracabad Station site without consideration of tree screening indicates that the tips (125 metres high) of up to 12 turbines will be seen from the residence while only seven hubs (80 metres high) will be seen from the residence. This indicates the screening provided by topography where, for five turbines, the top of the blade sweep will be in the viewfield but the hubs of those same turbines will be masked by topography. The remaining 15 northern turbines will be completely screened from view by topography. The assessment is conservative and does not take into account the additional screening effect provided by trees. The respondent has misunderstood the assessment process applied despite it being described in the visual impact assessment report.

Observations of the Furracabad Station site from a position on Cherry Tree Road to the north of Furracabad Station shows only a wall of trees behind which the Furracabad Station residences are located. This is illustrated in Appendix C6. The respondent appears to be ignoring the fact that tree screening is already in place and that the indicated visibility in the Environmental Assessment is a gross overestimate.

Respondent (C10) statement - However they seek to minimise these stated effects by falsely concluding that "It is likely that many view points will only provide partial views of the wind farm with parts of it being concealed by topography and/or woodland." This is certainly not the case when you analyse Table 7.2 in Vol 2, Appendix C, p36 which indicates the large number of turbines visible from virtually all the 40 neighbouring residences within 3km (both valleys) and this doesn't include the affected residences out to 10km. The "Zones of Visual Influence" map Figure 11, however does demonstrate the vast surrounding area where 21-27 turbines are in fact visible.

The statement in the Environmental Assessment, that many viewpoints will only provide partial views of the wind farm with parts of it being concealed by topography and/or woodland, is true. The statement is vindicated by reference to the conservative data provided in Table 7.2 and the viewfield figures number 7 to 11 of the Visual Impact Assessment. The respondent has referenced Figure 11 which also shows that the screening effect is marked at viewpoint locations close to the wind farm. Areas shaded blue that are close to the wind farm site indicate significant screening by topography. Again it is emphasised that Figure 11 does not incorporate the effects of screening by trees and is therefore conservative. As indicated for the previous respondent (C9) statement and the example of Furracabad Station the visibility of the wind farm as shown in the Environmental Assessment appears to be a gross over estimate and this is likely to be the case for many other residences included in Table 7.2.

Respondent (D1) statement – I refer you to Figure 11 (Appendix C) of the Environmental Assessment (Environmental Assessment). While the legend on this figure obscures the majority of 'Talarook', it would appear that at least 26 (and probably all 27) of the proposed turbines would be clearly visible from 'Talarook' homestead and approximately 85% of the property as a whole.

The Respondent acknowledges that all 27 turbines could be visible from the Talarook homestead as there is very limited topographic screening. However, it is once again emphasised that Figure 11 (Appendix C) does not take into account the effect of tree screening. The homestead is 3.6 kilometres from the nearest proposed turbine with an elevation angle to hub height of 4.5°. As such, wind turbines could be effectively screened from the residence with selective tree planting. Appendix C13 includes a Google Earth image of the setting of the Respondent D1's residence which shows significant trees around the residence.

Respondent (D1) statement – We request the proponent be required to relocate the legend on Figure 11(Appendix C) which totally obscures 'Talarook' and provide a copy of the revised figure. In this manner the visual impact of the Windfarm can be adequately assessed from all portions of 'Talarook'.

This has been completed as shown in Figure SR 7.

Respondent (D2) statement - The visual assessment does not include Waterloo Station, despite 27 turbines being visible from the front verandah of the homestead.

The visual assessment does include Waterloo Station. An extract from Table 7.2, Appendix C of the Environmental Assessment has been included here. Although there is little topographic screening of the proposed wind farm at the residence, there is the potential for tree screening, which has not been

taken into account. At a distance of 3.6 kilometres and an elevation angle of 4.9°, selective tree planting would be effective. Aerial photography of the residence is provided in Appendix C8.

Residence	No. visible turbines		Distance closest turbine (km)	Viewfield angle (degrees)	Est. visibility class	Screening by trees	Comment
	Tips	Hubs					
Waterloo Station	27	26	3.6	60	Moderate	Yes	Mid distance views to wind farm, may be some tree screening

3.3.7 Residences surrounded by turbines

Respondent (C9) statement – Refers to Vol 2; Appendix C; 10 – Mitigating Options – Para 2.
"**None of the neighbouring residences will be surrounded by turbines…".**
However, the respondent notes that "Highfields", "Eungai or Cherry Tree" and "Mayvona" have turbines to their south, west and north views, and within 2 kilometres. It may not be 360 degrees, but certainly more than 180 degrees. This will certainly have the feel of being surrounded by turbines.

The circumstances have not been correctly indicated by the respondent and the viewfield for all of the residences is less than 140 degrees. The actual circumstances of the residences, in terms of the viewfield containing the wind farm, are shown in the Table below. None of the residences can be described as being surrounded by wind turbines and the maximum proportion of residence viewfield affected by turbines is 38% for Highfields. Figures SR 3, 4 and 5 demonstrate the viewfield angle from each of these residences.

Residence	Viewfield (degrees)	Viewfield not occupied by the wind farm (degrees)	Proportion of viewfield occupied by wind farm
Highfields	136	224	38%
Mayvona	128	232	36%
Cherry Tree (formerly Eungai)	112	248	31%

Respondent (C10) statement - The Furracabad Valley residences of Highfields, Cherry Tree (formerly Eungai), Mayvona and Lombardy are within 2km of turbines contrary to the wishes of valley residents and the Glen Innes Severn Council as expressed in their DCP for Wind Power Generation. The residences have views of multiple turbines, and Highfields and Cherry Tree are virtually surrounded except on their eastern sides.

As indicated above the respondent's reference to the residences being surrounded is exaggerated.

Respondent (C10) statement - Mayvona may be vacant and in need of renovation but it is a valuable property on its own title with a right to a residence.

The respondent states that Mayvona is a valuable property, with a right to a residence. The proponent believes that the residence has been vacant for some considerable time and is in a state of disrepair. When Aurecon visited the site, Mr Daniel McAlary warned the visiting consultants not to enter the building as it was not safe. The proponent is not aware of any current proposals for its re-building. The proponent is also aware that the McAlary families are already associated with 6 other residences at this general locality, not all of which are occupied and the main landowners Mr Frank McAlary and wife Mrs Pat McAlary are indicated to live in Sydney and have extensive property holdings.

3.3.8 Visual impact a nuisance at Common Law

Respondent (C7) statement - The visual impact of the wind farm turbines on each of the residences hereafter discussed is in my opinion a nuisance at Common Law and should not be approved as unjust to the landowner.

Comments are provided below in respect of each of the respondent's statements for each residence addressed by the respondent. However, the opinion that the wind farm would be a nuisance at Common Law does not appear to be applicable where the project is implemented in compliance with Project Approval Conditions.

Respondent (C7) Statement - Lombardy - The only photograph of Lombardy are directed to showing a grove of trees to its west, but these trees could not have been inspected by Aurecon such trees are shedding their lower branches through age. Until the wind farm turbines are erected it is impossible to know to what extent the visual impact of turbines, less than 2km away, can be absorbed by the ageing trees. Further as the trees are already ageing they will die quite soon. They may be gone before the wind farm is built.

The visual impact of turbine 22B in the group of turbines on Dulhunty land is shown as "High" in the Environmental Report. See Vol 2 Appendix C page 37. This is a correct assessment. However it is reduced because of alleged screening of trees. No careful inspection appears to have been made of the trees which are directly to the west of Lombardy. The Dulhunty group are to the North West and the Fletcher group are to the South West of Lombardy.

Appendix C5 provides more details on the setting of the Lombardy residence. The cycle of trees is not uncommon and where trees age and die, a landowner is able to undertake replacement plantings. Should the project proceed then the proponent would assist the resident with tree screening of the wind farm if that were desired by the landowner.

Residence	No. visible turbines		Distance closest turbine (km)	Viewfield angle (degrees)	Est. visibility class	Screening by trees	Comment
	Tips	Hubs					
Lombardy	17	13	1.9	90	High	Yes	Extensive screening by trees

Visual Impact was stated to be 'Moderate' in the Environmental Assessment. This takes account of the degree of screening that is presently in place around the residence.

Respondent (C7) Statement **- Klossie - Turbines 18 and 19 will be very prominent about 2.3km to the north of the residence on the hill top. There is no screening of the residence. See Report of Aurecon Vol 2 Review of Visual Impact page 37. Visual Impact must be high.**

The Klossie residence has an easterly aspect away from the wind farm and being to the south of the wind farm will only have a limited viewfield angle of the visible parts of the wind farm.

Residence	No. visible turbines		Distance closest turbine (km)	Viewfield angle (degrees)	Est. visibility class	Screening by trees	Comment
	Tips	Hubs					
Klossie	10	7	2.3	39	Mod	Partial	T18 & 19 prominent 2.3 km to north of residence, limited screening by trees to north of residence.

Visual Impact was stated to be 'Low' in the Environmental Assessment. Tree screening to the north of the residence would be provided by the proponent if requested by the owner.

Respondent (C7) Statement - Mayvona - Mayvona is a cottage originally built as a farm residence but currently unoccupied pending renovation. But it is doubtful whether renovation will proceed because of the high visual and noise impact which the group of turbines numbers 22B, 21B 20B and 10 (all on Dulhunty leased land) will have upon the Mayvona site. These turbines are less than one kilometre from the Mayvona cottage and it would be foolish to spend thousands of dollars in resuscitating the building only to find no one will buy the farm area as the impact is very high.

The cottage site is effectively sterilised by the turbines and the value of the farm significantly reduced. It is saleable only as part of a 500 acre farm at a much lower price per acre than the price per acre of a 200 acre farm with a cottage site. See the LEP for Glen Severn Council.

The Mayvona residence is an old dilapidated building that does not appear to have been lived in for some considerable time. There does not appear to be any indication that it is to be restored in the near future and the respondent has indicated that it is doubtful that renovation would proceed if the wind farm were to proceed.

Residence	No. visible turbines		Distance closest turbine (km)	Viewfield angle (degrees)	Est. visibility class	Screening by trees	Comment
	Tips	Hubs					
Mayvona	10	10	0.85	128	H	Partial	Vacant – close views to south east turbines, some screening by trees

Visual Impact was stated to be High in the Environmental Assessment. Photomontages for Mayvona are provided with this submissions report as Plates 5 and 6.

Respondent (C7) Statement **- Wandsworth - Wandsworth is discussed in the Report Vol 2 Page 31 under the heading "Visual Impact Assessment", and the author's "Summary of Visual Impact Assessment" is at Vol 2 Page 34. The cottage is 2.3km from the nearest turbine. It faces to the west with 360 degree exposure to the turbines of the Fletcher and Dulhunty groups. It has no tree screening. With such a complete exposure to the wind farm, the visual impact must be assessed as "high".**

Mr Frank McAlary suggests that Wandsworth has a 360 degree exposure to the turbines. Wandsworth is located in the middle of the Furracabad Valley and the Environmental Assessment has assessed the view field angle as only 75 degrees. This means that the remainder of the viewfield from the residence (some 285 degrees) is not toward the wind farm. Nevertheless the Environmental Assessment has attributed a classification for Wandsworth of high visibility. Tree screening would be effective at this location and the proponent would assist with its development if requested by the respondent.

Residence	No. visible turbines		Distance closest turbine (km)	Viewfield angle (degrees)	Est. visibility class	Screening by trees	Comment
	Tips	Hubs					
Wandsworth	18	15	2.3	75	High	No	Views to central eastern part of wind farm, limited screening by trees

Visual Impact was stated to be Moderate in the Environmental Assessment.

***Respondent (C7) Statement* - Wandsworth -. Any potential for tree planting with the possibility of future screening is obviously irrelevant. Firstly it may never occur. Secondly in litigation at Common Law it is not relevant and no defence to the action that the Plaintiff could avoid the adverse impact by making changes to his land. For example, sound proof his home to reduce excessive noise.**

The proponent believes that tree planting could be undertaken at selected locations at Wandsworth to screen the views to the wind farm, if the landowner thought that it was beneficial and requested assistance from Glen Innes Wind Power. While part of the viewfield for Wandsworth would be impacted by the wind farm there would remain a significant viewfield unaffected by the wind farm. The proponent does not believe that it would be subject to litigation under common law for implementing a project that complied with the conditions of a Project Approval granted by the Minister for Planning under Part 3A of the EP&A Act.

***Respondent (C7) Statement – Wandsworth* – Clearly the Fletcher turbines are a legal nuisance.**

The six Fletcher turbines referred to by respondent C7 are at the following distances from Wandsworth:

- Turbine 18 – 2.3km
- Turbine 19 – 2.3km
- Turbine 17 – 2.9km
- Turbine 15 – 3.2km
- Turbine 16B – 2.9km
- Turbine 16C – 3.2km

Given the distances involved between Wandsworth and the turbines on the Fletcher property, the statement by Mr Frank McAlary appears to exaggerate the circumstances.

Respondent (C9) statement - We refer to Vol 2. Appendix C; page 6, point 2.3, the Consultants agree that for the closest neighbouring residences (one only 0.96 kilometres from the nearest turbine with others starting from 1.3 kilometres), "Given the size of the turbines, their scale in the landscape can be significant for the closest residences."

The home that has the closest turbine is "Highfields". But it is not just this one turbine that impacts on this property. This property is "hugged" by several turbines. The impact of these turbines on this one property, if they proceed, must be considered unacceptable and a Nuisance at Common Law, due to visual and auditory impacts.

The author of the Environmental Assessment admits that the impact on these residences is, in the main, high however, the Proponent has refused to reconfigure the wind farm to improve the position of these severely impacted homes. (Vol 1; Table 6.2; Page 9 and Vol 2; Appendix C; Table 7.3; Page 40). Each one of these homes has a strong Common Law case of Nuisance, due to Visual and Auditory impact.

Review of the location of Highfields indicates that it is actually 1.03 kilometres from the nearest turbine (T18). As indicated on Plates 1 and 2 there is significant tree screening for the residence.

The proponent has undertaken reviews of alternate layouts and various turbine equipment and is still working through that process. The final array configuration is rarely determined at the time of planning approval and the Proponent is seeking to define the envelope and conditions which it must work within to complete its negotiations with potential equipment suppliers and construction contractors so the

design of the wind farm can be finalised. The arrangement in the Environmental Assessment presents the maximum development.

Respondent (C9) statement - Other homes are also "moderately" impacted including our properties "Oakes" (as the Environmental Assessment calls it) and Furracabad Station, which is actually 3 houses, just over 3 km away. We believe that the value of our properties will be severely impacted by the spectre of the southern turbines, if they proceed in their current form. We believe that we would have a Common Law case of Nuisance, due to Visual Impact, at the very minimum at Furracabad Homestead, and a case of Nuisance due to both Visual and Auditory at the "Oakes" residence.

The Furracabad Station residences are not amongst the closest residences to the wind farm and have various degrees of topographic and tree screening to limit views of the full extent of the wind farm.

Green Valley (referred to as Oakes in the Environmental Assessment) is 2.5 kilometres from the closest turbine, Turbine 17. Green Valley is at the foot of the western slope of Waterloo Range and would be expected to have a north western and western outlook across the Wellingrove Valley and away from the wind farm. Appendix C7 provides an aerial view of the residence. As such the visual impact at the residence could be considered as 'Low'.

Furracabad Station is just over 3 kilometres to the south of the wind farm and topographic and tree screening will combine to reduce the visual impact at the residences in Furracabad Valley. Appendix C6 provides an aerial view of the residence. The turbine visibility shown in the table below appears overstated due to tree screening that has not been taken into account by the Windfarmer model that was used to derive these figures.

Residence	No. visible turbines		Distance closest turbine (km)	Viewfield angle (degrees)	Est. visibility class	Screening by trees	Comment
	Tips	Hubs					
Green Valley	18	15	2.5	55	Mod	Yes	Sthn. turbines most prominent, some screening by trees and topography
Furracabad Station	12	7	3.1	32	Mod	Yes	Limited views of southern part of wind farm. Some tree screening.

Respondent C14 statement – The issue of "nuisance" is once again raised (in relation to visual amenity)

The owners and occupants of Highfields are the closest residents to the wind farm and are expected to have concerns about the development of wind turbines on nearby ridges. The main outlook from the residence appears to be to the north east and is away from the wind farm. However, the yard at the rear of the residence is on the side that faces the wind farm. The presence of large trees on the western side of the residence will limit views of parts of the wind farm but it is likely that filtered views of the wind farm will be available from close to the residence. Turbine 18 will be visible to the south west but tree planting could be arranged on that side if requested by the landowners. Existing planting adjacent the driveway will very likely provide some screening towards T18 and T19.

3.3.9 Social acceptability of the wind farm and its visual impact

Respondent (C9) statement - The Environmental Assessment admits that neighbouring residences will have <u>significant visual impact</u> from this proposed wind farm. This is <u>completely unacceptable in today's social environment.</u>

The proponent is aware that developments of a diverse range of types will often be considered by some neighbours as adverse. Ideally a consensus will be achieved between developers and the local community for the final form of the development but this is not always possible due to inability to achieve a solution that meets the needs of all stakeholders.

The respondent appears to underestimate the potential future contribution of wind energy developments and evolving social context that recognises an increased need for renewable energy production and reduction of Australia's greenhouse gas emissions. Decisions relating to wind farm approvals must by their nature take into account both the individual values of the neighbouring community and the collective benefits of the wind farm development. The Environmental Assessment addresses the various impacts and benefits and provides a basis for collective assessment of the issues. The Department of Planning will make its own independent investigation of this matter based on the material available, its site inspection and respondent submissions in forming its guidance to the Minister for the decision making process.

3.3.10 Visual absorption capability

Respondent (C9) statement - Vol 2; Appendix C; 2.5.6 Page 13 Visual Absorption Capability. First paragraph in this section, last sentence. **"It could be said that the scale and form of the wind turbines contrast with the rural scenes and as such there would be a low visual absorption capability for wind farms."**

The term 'visual absorption capability' has been typically applied in forestry projects but is perhaps less suited to wind farm projects. On one hand it can be said that the prominence of the turbines leads to the position that there is a low visual absorption capacity. When considered in terms of the rugged terrain of Waterloo Range and the Wellingrove, Reddestone and Furracabad valleys there is considerable variation in the visible parts of the wind farm from different vantage points. Figures 7 to 10 of the Visual Assessment Report shows this variation in visibility of different parts of the wind farm and Figure 11 show the number of turbines visible around the wind farm. Figure 11 shows that being close to the wind farm does not necessarily mean that a greater part of the wind farm is seen as there can be a greater masking effect by topography.

Respondent (C9) statement - Doesn't this contradict what they have stated under section 7.3.6 in Vol 2; Appendix C; Pastoral Setting – 2nd paragraph **"the ability of the pastoral landscape elements to absorb the proposed wind farm is considered to be high as the project is consistent with the surrounding land uses and visual changes that are seen in the highly modified landscape of farming and grazing areas."** ***This is an incorrect statement. It is also a clear back-flip on the part of the developers and consultants. The report is not put together in a cohesive manner and contains many inaccuracies and inconsistencies.***

The respondent is in this instance is correct that the reason stated does not explain the high visual absorption capability of the locality. That is attributed to the aspects described in the previous point referencing Figures 7 to 11 and indicating the significant effect that topography has in screening more distant part of the wind farm. Again each of the viewfield projections shown in Figures 7 to 10 and the calculation of the number of turbines shown graphically in Figure 11 are without the additional effect of screening by trees.

Respondent (C9) statement - The Report continues to make statements that are erroneous. Vol 2. Appendix C; 7.3.6 Pastoral Setting. The report states **"The ability of the pastoral landscape elements to absorb the proposed wind farm is considered to be high as the project is consistent with the surrounding land uses and visual changes that are seen in the highly modified landscape of farming and grazing areas."**
There is no possibility of the surrounding landscape absorbing 130 metre high wind turbines. These turbines are not consistent with the modified landscape of the southern end of the Furracabad Valley. We refute this statement and believe it to be completely false.

This issue has been addressed in the above section. Previous items have also addressed the effect of tree screening at Furracabad Station and that the Environmental Assessment significantly overstates the wind farm visibility for assessed residences.

Respondent (C10) statement - The consultant's perspective on the visual qualities of the Furracabad Valley and Waterloo Range is generally disparaging eg "As the Waterloo Range is a common landscape element within the Glen Innes Severn region and the wider New England region the sensitivity to the visual impact from the wind farm is viewed as low." see Vol 2, Appendix C, P41 and "The ability of the pastoral landscape elements to absorb the proposed wind farm is considered to be high as the project is consistent with the surrounding land uses and visual changes that are seen in the highly modified landscape of farming and grazing uses"……
It is nonsense to suggest that this landscape can "absorb" 130 metre industrial wind turbines on its ridges and in close proximity to residences. Not to mention the likely possibility of turbine lighting which will change our night skies.

The visual qualities of the Waterloo Range in a regional perspective are not considered either unique or outstanding and therefore sensitivity when considered broadly is less then would be attributed by the local community. The previous responses have indicated the effectiveness of screening by topography and screening. The requirement for lighting on the turbines has not yet been confirmed and it is the proponent's view that this site may not warrant lighting on selected turbines.

3.3.11 Visual prominence versus visual dominance

Respondent (C9) statement - Vol 2; Appendix C; 2.5.6; page 14; paragraph 4. The author appears to be playing semantics with the words "prominence" to characterize the position of turbines in the landscape rather than "dominance". We would argue "Dominance" at the southern end of the Furracabad Valley and believe that this is hard to refute.

The proponent maintains that prominence is the correct terminology for the wind turbines in the landscape. While the turbines will be prominent features it can be easily argued that in terms of bulk they constitute a very small part of any particular scene. Dominance would appear to imply that the considerable proportion of a scene that comprises the rural setting will not be noticed by a viewer or will be hidden from view by the turbine structure.

In most cases the rural residences have significant parts of their viewfield that are not occupied by wind turbines. Even Highfields which potentially has the largest viewfield angle occupied by the wind farm at 136 degrees has a 224 degree viewfield that is unaffected by the wind farm. It is noted that Highfields has its main outlook to the north-east away from the wind farm. Additionally, the yard behind the house has significant mature trees adjacent that will limit views of the wind farm.

It is noted that for Plates 3 and 4 for the Cherry Tree residence that sheds in the foreground of these scenes are more dominant than the turbines which are regarded as dominant by the landowner.

An individual's attention to the detail in a scene will most likely be affected by their own focus of interest in the scene. By way of example, a visitor to the area who is familiar with rural land but has not previously seen wind turbines would be very likely to focus their attention on the wind turbines. In contrast after the wind farm has been installed the local community that has an interest in working the land would probably direct their attention to the land which constitutes their livelihood and the wind turbines could attract less of their attention.

Some respondents have indicated that sunsets are an important part of the landscape for them and these will still be visible despite the presence of the wind farm, which may only involve a few turbines within the sunset vista.

3.3.12 Consultation and landscape values

The issue of consultation with the local community has been addressed as a separate issue in section 3.14 of this Submissions Report. Several aspects of consultation related to assessment of landscape values are also addressed here.

Respondent (C9) statement - Vol 2. Appendix C 2.5.2 Page 11 – Consultation with landowners and landscape values. Paragraphs 1, 2 and 3 in this section, we believe, are false. We would like to see their records of those neighbours that they contacted and consulted with. We are in constant communication with all valley residents (aside from the wind farm landowners), none of whom have been contacted or consulted. Could it be that the developers are only consulting with wind farm landowners? If this is the case, then it brings into question the honesty and validity of the entire report.

The consultation that was undertaken was via a range of means including visits to many landowners with three kilometres of the wind farm, information days held in Glen Innes and information brochures distributed to community members by hand, mail or through other neighbours passing these on to friends. The visits focused on residences within three kilometres around the full wind farm site and were not limited to Furracabad Valley. It appears that many of the respondent submissions indicating that they did not receive visits have residences outside the three kilometres from the project or were not present in the area to be consulted when visits were undertaken. Others that have indicated they have not been consulted have also not attended the information days held in Glen Innes.

Respondent (C9) statement - Further, we do not believe that Glen Innes Wind Power initiated meaningful alternations to the wind farm layout to mitigate visual impacts. We would like to know in detail, exactly what has been done to support this claim.

It is reasonable for respondent's to claim that they have not seen meaningful alterations to the wind farm layout to mitigate visual impacts. This has not occurred because despite the proponent's efforts to review the proposed layout a feasible alternative layout has not yet been confirmed. This matter is subject to ongoing review through negotiations occurring with the Grid operator, equipment suppliers, construction contractors and the proponent. Such reviews are also difficult to complete in light of the uncertainty associated with the Project Approval and conditions to be applied. The final arrangement is unlikely to be determined until the Approval has been granted, a contractor selected and negotiations completed. The arrangement in the Environmental Assessment represents the maximum development that would occur at the site.

Respondent (C9) statement - Also in this section, page 12, first paragraph, last sentence, **"Concerns regarding the development may also be exacerbated by anxiety in respect of land values and in these cases it can be difficult to distinguish the primary source of concern."**

It is not unreasonable for a proponent to form a view that a neighbour's concerns in relation to the wind farm development may be heavily influenced by concerns about the value of their property asset. While the impact on land values due to wind farm developments has not been confirmed, a neighbour's anxiety may nevertheless be a valid feeling for a neighbour that could influence their level of objection to a wind farm development.

Respondent (C9) statement - If the developers have experience in wind farm developments, they are fully aware of neighbours concerns. It is all of the issues raised. No one concern can be looked at in isolation. It is the cumulative impact of all issues. This is why we seek to remove the already documented turbines. We do not wish to stop the overall project.

While the respondent appears to rate all issues as being equally important and collectively contributing to their objection the proponent would consider some issues as being of issues of concern that could

be applicable for any proposed development and where neighbours may object but which would not constitute grounds for refusal for the proposal. The focus should therefore be directed to issues which are judged as unreasonable imposts when taken in perspective of the overall merits and impacts of the proposal and relative to the objector's rights in limiting the development of the land by the wind farmer owners of the respective lands.

The removal of ten turbines as requested by a number of respondents would have a significant effect on the project and could be seen as an unreasonable limitation on a beneficial renewable energy project.

Respondent (C10) statement - We take issue with many of the propositions in Vol 2, Appendix C 2.5.2 "Consultation with landowners and landscape values" such as "The initial consultation was carried out by visiting many of the neighbours to the development...and that many neighbours are generally supportive of wind energy developments..." There is no evidence that such visits or consultation actually took place and we have evidence to the contrary. There has also been little modification of the wind farm layout to mitigate visual impacts as suggested, in fact the number of turbines was increased from 22 to 27 with a turbine no 16B added next door to the most affected residence Highfields for good measure!

As previously discussed consultation was undertaken via a range of means and focused on residences within 3 kilometres in all areas surrounding the wind farm. The consultation process is discussed in more detail in Section 3.14. It is reasonable for respondent's to claim that they have not seen meaningful alterations to the wind farm layout to mitigate visual impacts. This has not occurred because despite the proponent's efforts to review the proposed layout a feasible alternative layout has not yet been confirmed.

The increased number of turbines from 22 to 27 has not changed the project envelope in respect of the turbines located adjacent to Furracabad Valley.

3.3.13 Shadow Flicker

Shadow Flicker is generally treated separately to visual impact and describes an effect caused by the rotating turbine blades periodically blocking the sun's rays and causing a flickering shadow effect at a particular location. The effect in relation to wind farms has been attributed as having potential to cause annoyance and in certain circumstances to have potential for impacts on health of some individuals. The issue was therefore comprehensively assessed in the Environmental Assessment. The effect diminishes with distance and is not predicted to significantly affect any occupied residences in the surrounding areas (see Appendix D of the Environmental Assessment).

Despite the above, a number of the respondents raised the issue as being of concern for them.

Respondent (C9, C10) submission – When turning with the sun behind them, turbine blades cast moving shadows across the landscape and houses, described as a strobe effect within houses, which can be difficult to block out. Some people lose their balance or become nauseated from seeing the movement. As with car or sea sickness, this is because the three organs of position perception (the inner ear, eyes and stretch receptors in muscles and joints) are not agreeing with each other; the eyes say there is movement, while the ears and stretch receptors do not. People with a personal or family history of migraine, or migraine-associated phenomena such as car sickness or vertigo are more susceptible to these effects. The strobe effect can also provoke seizures in people with epilepsy.

An example was also provided for Lincoln Township, WI two years after installation that indicated that the following groups of people found shadows from blades to be a problem:

- ***33% of residents 800 ft (244m) to 0.25 mile (402 m)***

- ***40% of residents 0.25 mile (402 m) to 0.5 mile (805 m) away***
- ***18% of residents 0.5 mile (805 m) to one mile (1,609 m) away***
- ***3% of residents 1mile (1,609 m) to 2 miles (3,218 m) away***

The example for Lincoln Township WI provided in the respondent submission is not clear on the number of residents affected or the extent of that affect. It does mention that 230 people were sampled but does not indicate the distribution of the sample population around the wind farm. The previous part of their submission in relation to this matter presents an extreme picture of the potential effects that for several reasons are considered unlikely to be the case for the bulk of wind farm projects and to not be applicable for the Glen Innes Wind Farm project.

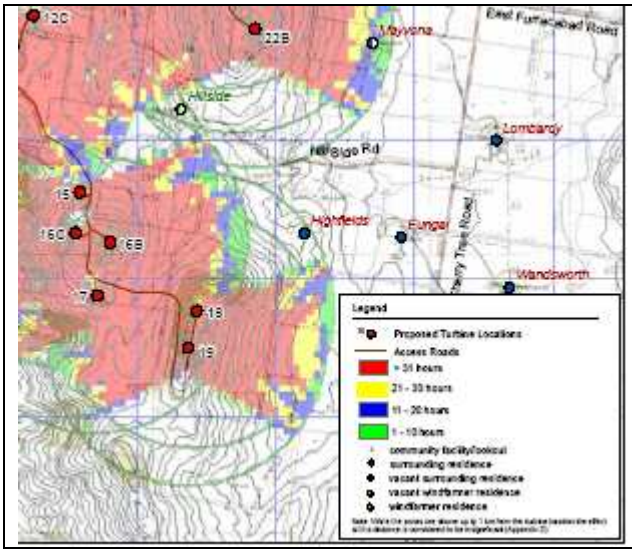
The Environmental Assessment provides a comprehensive review of the shadow flicker issue and has found that shadow flicker does not present a significant impact for the neighbouring residence locations. The only neighbouring residence that is located such that shadow flicker could impact the residence for short periods of time is the vacant Mayvona residence site. The proponent believes that for the reasons presented in the Shadow Flicker Appendix to the Environmental Assessment that at a distance of 850 metres the intensity of the effect will be significantly reduced. Also given the characteristics of the residence location and partial tree screening as well as the low turbine rotation speed and hence low flicker frequency there is very unlikely to be any impact of the wind farm on health at the location of the Mayvona cottage. The impact of shadow flicker effect at Mayvona has been assessed as occurring up to 10 hours per year. The 10 hours could be reduced by the coincidence of cloudy weather occurring at times when the effect would otherwise occur. The Mayvona residence is unoccupied and in a dilapidated state.

All other residences surrounding the wind farm are assessed as not being subject to any significant shadow flicker effects.

Respondent (C14) statement – We will be exposed to substantial shadow flicker - surrounded by 14 turbines, how could we not. This is once again substantiated by the Environmental Assessment (Chapter 6-10 & 11,Volume I). To suggest that "the number of large trees surrounding the residence mean that any shadow flicker effects that may occur would be largely mitigated" is once again admitting that there WILL be an impact, but to the proponents, this is not very much.

The Highfields residence where the respondent is located is the closest occupied residence to the wind farm. However, that does not mean that this correlates with “substantial shadow flicker” as indicated by the resident who indicates the residence is surrounded by 14 turbines. The residence does have views towards the wind farm over 38% of its total viewfield which does not correlate with being surrounded.

The detailed shadow flicker assessment shows that Highfields is not within the zone of potential shadow flicker effect. The respondent’s perception that shadow flicker may be substantive could have been gained by their reference to inaccurate web site articles that exaggerate the geographic extent and significance of the effect. Reasons for the effect being less than that indicated in the web site articles are outlined in the Shadow Flicker analysis provided in Appendix D of the Environmental Assessment. Figure 6.8 of the Environmental Assessment shows the areas surrounding the wind farm that could be subject to the shadow flicker effect at times. A section of Figure 6.8 is shown below and shows that Highfields is not within the area that could be subject to the shadow flicker effect.



Section of Figure 6.8 of the Environmental Assessment that shows that Highfields is not within an area that is indicated to be subject to shadow flicker effect. This is due to distance of the residence from the turbines and the angular relationship relative to rays of sunlight reaching the residence that could be affected by rotating blades at various times of the year.
Additionally, there is significant tree screening at the residence such that even if there was potential for shadow flicker at certain times, its effect could be mitigated by the tree screening

Respondent (C5) statement – The environmental assessment documents tends to dismiss the possible health issues which will be caused by the impact of shadow flicker and blade glint that will be seen throughout the valley when the sun is shining.

The Environmental Assessment includes a full assessment of shadow flicker and provides the basis for the wind farm not being associated with shadow flicker effects that could affect the health of the surrounding community. The respondent's residence is about four kilometres from the nearest turbine and there appears to be substantive tree screening to the west of the residence. These factors rule out the possibility of being subject to shadow flicker.

Glint may be temporarily noticeable at some locations and at a significant distance but by its nature will have short term duration and limited effect. This issue is recognised as potentially evident at times around wind farms but it appears that its consideration for other jurisdictions is that it is a minor issue which is not given such weight as to determine whether a project may or may not proceed. It is generally managed by ensuring that the finish on the turbine blades will reduce the extent of the effect. The tree screening near the respondent's residence would mitigate or avoid this effect at times when Glint was occurring.

Respondent (C14) statement – Blade glint will be an issue for the residences of the Furracabad Valley although the proponents believe because of a "...low density of settlement (there are 11 houses within the 3km buffer) in the areas that could be potentially affected and the low volumes of traffic on the local roads. Where it does occur it (blade glint) will be of short term duration....." (Chapter 6-11, Volume I). Does this hazard mean less because our lives are not as important as others?

Respondent (D2) statement - Blade Glint is also noted as a possible impact, however limited detail is provided.

Glint may be temporarily noticeable at some locations and at significant distance but by its nature will have short term duration and limited effect. This issue is recognised as potentially evident at times around wind farms but one which is generally managed by ensuring that the finish on the turbine blades will reduce the extent of the effect.

3.3.14 Photomontage sites do not include neighbouring residences

The Environmental Assessment has included ten photomontages prepared for representative locations around the wind farm site. These collectively provide representations of the form of the wind farm when viewed from different directions around the wind farm. For a specific locality the actual form of the wind

farm does not generally change greatly by moving the viewpoint slightly. However, as Aurecon generally chose viewpoints without tree screening, the form of the wind farm visible from some nearby residences may be less due to the presence of some trees near the residence. As such it was considered that the representative viewpoints provided a basis for considering the visual impact however it is noted that a number of respondents have not agreed with this position.

The Department of Planning has also considered that it would be helpful for their review to have photomontages for some residences that are closer to the wind farm and in their letter of 18th March 2009 they requested that photomontages be prepared for Highfields, Mayvona, Ilparran and Cherry tree (Eungai). The proponent has provided these additional photomontages with this submissions report as Plates 1 to 8. The process undertaken for the photomontages is described in Section 3.3.15.

Respondent (C1) statement – The Environmental Assessment does not include photomontages of nearby turbines in relation to our home, or any other residence with high visual impact. We believe that the failure to include such photomontages is a huge gap in what should be a professional assessment of visual impact.

The Environmental Assessment provides a series of photomontages from representative locations around the wind farm. These are considered by the proponent to enable neighbours to understand the visual impact of the proposed wind farm at their locality. The respondent's relative who lives on a neighbouring property Lombardy appears to have had no difficulty making his own assessment of the potential visual impact including showing the screening provided by existing trees. It is a feature of the photomontages provided in the Environmental Assessment that they have avoided locations where existing tree screening limited views to the wind farm. This is considered to provide a better simulation of the general appearance of the wind farm from the locality where the photomontage was prepared.

The proponent has arranged to supply two photomontages for the Cherry Tree residence as requested by the Department of Planning in its letter of 18th March 2009. The photomontages are from living areas in or very close to the residence and are attached to this report as Plate 3 and 4. In addition Figure SR4 shows the arrangement of turbines relative to the residence and Appendix C2 provides images for the setting of the Cherry tree residence.

Respondent (C6) statement – Failed to obtain the best visual evidence to assess the effects of turbines upon neighbours. The Environmental Assessment seeks to assess the visual impact of the wind towers by creating the photomontages particularly from road junctions, and allegedly presenting a "representative" assessment of the impact of the development. Surely the only way to assess the visual impact on neighbours is to take photos from the residences and plant the proposed wind towers on them.

The respondent makes the statement that photomontages should have been taken from neighbouring residences. However, the respondent's residence at about two kilometres distance from the nearest turbine has significant tree screening around the residence. The respondent has also been able to gain an impression of the visual impact as indicated in material supplied with the respondent's submission. Further information is supplied in this submissions report in relation to the situation of the residence and the positioning of trees around the residence (Appendix C5).

Respondent (C7) statement – One would expect that Aurecon's report would provide photomontages taken from the relevant residences. These would provide physical evidence from which the impact of turbines within 3km of that residence could be assessed. But the report does not follow this logical path. Instead the author takes 10 locations for a series of colour photographs as 10 representative view points. Yet none of these ten are taken at the residences; they are taken to give views of the locality. They are little help in understanding the visual impact of the turbines on a person living in the residence.

The respondent's comment is similar to the matters raised by the previous items and has been dealt with above. The respondent owns a large amount of property at the locality and some of the related residences are described further in Appendices C3, C5 and C11.

Respondent (C7) submission - The Report makes no attempt to analyse each individual home. The author's summary is to be found in Vol 1 Chapter 6 Page 7 in Table 6.1 where "Visibility and visual impact" are assessed and a "Summary of Visual Impact Assessment for residences within 3km of the wind farm" is given in Table 6.2, page 9 of Chapter 6 of Vol 1. The visual impact assessment stated in this summary should be rejected as the "visual impact" made in the summary is based on the erroneous procedures discussed above.

The Visual assessment report provides information that can be used by the local community or the Department to assess contributory factors to the visual impact at each specific residence location. As the data in the Table in relation to number of visible turbines is based on the 'Windfarmer' model software incorporating the digital terrain model without allowance for trees and the screening they may provide, the results are conservative. As such the visibility of turbines is likely to be overstated. Appendices C1 – C13, Figures SR3 - 7 and Plates 1 to 8 provide additional information relative to visual characteristics of neighbouring residences that is considered to assist the understanding of the circumstances of neighbouring residences.

Respondent (C9) statement **- The Director-General's requirements state that "*The Environmental Assessment must assess the visual impact of the proposal on this landscape (including existing and approved dwellings) for a distance of at least 10 kms from the turbines…"* and *"A photographic assessment clearly demonstrating the potential visual amenity impacts of the proposal must be provided along with the clear description of visual amenity mitigation and management issues…". In the Environmental Assessment the authors have downplayed the visual impact of these turbines, particularly in their omission of photomontages actually taken from the residences most affected.***

The matter of provision of photomontages has been addressed above and as indicated the Department has requested additional photomontages from four locations and the proponent has arranged to provide these. A photomontage was provided for an elevated location in Glen Innes (Martins Lookout) but as seen in this image the visual impact is minor. Many locations at lower levels within Glen Innes township may not provide views to the wind farm due to screening by buildings or trees or having an aspect away from the wind farm.

Respondent (C9) statement - Glaringly absent are photomontages from the abovementioned residences – those most affected at the southern end of Furracabad Valley. Therefore, the viewpoints that have been neglected are from "Highfields" front door, looking at the numerous turbines hugging their property; the viewpoints from "Eungai" or "Cherry Tree" from their front door and from their entertainment area, facing north down the valley; the view from the Mayvona. It is a saleable piece of real estate and cannot be dismissed simply because it is currently vacant; and Lombardy. All properties are at the southern end of the valley and within 2 kilometres of the wind farm. We reiterate, the 10 turbines constantly referred to in this submission are the problem turbines in question.

We believe that the 10 colour photos taken to produce the photomontages are not representative of the impact on the homes close by, but merely viewpoints around the countryside, thus not providing a true picture of the impact on individuals.

The matter of viewpoint locations for photomontages has been addressed above. Eight additional photomontages are provided from four locations with this submission's report for residence locations close to the wind farm as requested by the Department of Planning. They are provided in Plates 1 to 8 of Appendix D of this report.

Respondent (C9) statement - Further, viewpoints 4, 9 and 10 have been photographed on a cloudy day. The visual impact of the turbines is clearly understated on such days.

Aurecon has attempted to obtain photomontages that have clear sky views so as to clearly indicate the turbines in the completed photomontages. However such conditions are not always available when visits to the site are made. Despite a series of visits to the site, the suitable conditions were not obtained for all locations. At times when conditions were suitable the camera would have been directed toward the sun which would have limited the quality of the photography. Where photomontages were prepared using cloudy skies Aurecon graphics staff have sought to emphasise the visibility of the turbines in the photomontages.

The photomontages prepared by Aurecon for other wind farm sites have been compared with images of the installed wind farms in the landscape. In each case the visibility of turbines in the images produced after construction is less than shown in the photomontages used for the development applications. This is due to Aurecon's enhancement of visibility of turbines in the photomontage.

Respondent (C10) Statement - The glaring omission of photomontages of neighbouring residences with proposed turbines questions the commitment of the proponent to honestly represent visual impacts on affected residences.

The matter of provision of photomontages has been addressed above with Plates 1 to 8 providing photomontages at a further four sites as requested by the Department of Planning. Photomontages for the project have now been provided for a total of 14 viewpoints. The visual impact indicated in the additional eight photomontages for the four residence locations is considered to be reasonable and the turbines are less dominant than other cultural features in the respective scenes.

Respondent (C10) Statement - In the Environmental Assessment the authors have downplayed the visual impact of these turbines, particularly in their omission of meaningful photomontages taken from the residences most affected.

The matter of provision of photomontages has been addressed above. The respondent statement that the authors have downplayed the visual impact of the turbines does not recognise that the visual impact assessment has overstated the visual impact in several respects:

- Effect of tree screening has not been included in the viewfields generated from Geographic Information System (GIS) database that uses the digital terrain model and turbine dimensions
- Graphics staff have adjusted photomontages to assist identification of the turbines in the photomontages

The Aurecon visual assessment is accordingly conservative and overstates aspects of the visual impact. Additional photomontages Plates 1 to 8 do not indicate a high visual impact.

Respondent (C10) statement - Rather than providing photomontages from residences within 3km, with some photomontages including residential buildings for perspective they have published distant panoramas which do not reflect the actual human eye view from these close residences. And in half of these viewpoint panoramas the turbines are significantly obscured by cloud cover! Not much of an apparent effort in what should be a professional Environmental Assessment. "The objective of the photomontages was to provide a realistic representation of the appearance and scale of the wind farm in the landscape" states the Environmental Assessment Vol1, Ch6, P6 but the consultants have obviously failed.

The matter of provision of photomontages and the quality of the photomontages has been addressed above. The proponent has provided photomontages for an additional four residence locations with this Submissions Report. As can be seen in Plates 3 and 4, shed at the residence location are more prominent in the scenes than the turbines on the ridges.

Respondent (D1) statement – The boundary of 'Talarook' lies immediately behind the position from which the Viewpoint 1 photomontage (Jenkins Road adjacent to 'Caloola' property – Appendix C) was taken. Whilst the negative visual impact is obvious from this vantage point the entire Talarook property (including the homestead) lies at a higher elevation than Viewpoint 1, and the visual impact of the proposed wind farm increases substantially with elevation, such that all towers would be clearly evident in their entirety from the majority of the property.

Based on modelling with WindFarmer software, all 27 turbines will be visible from the Talarook homestead, as identified in Table 7.2, Appendix C of the Environmental Assessment. However, the elevation angle from the residence to the hub of the nearest turbine is 4.5° which would make tree screening at the residence a viable option to mitigate the moderate to low impact at this location.

Respondent (D2) statement - The visual assessment which appears in the Environmental Assessment contains gross misrepresentations in the simulated view photomontages. The turbines are coloured grey against the background which is not correct as the turbines which are proposed are white, and will be more visually prevalent.

Aurecon graphics staff have sought to emphasise the visibility of the turbines in the photomontages if the typically white turbines were not clearly visible against the sky in the available photography. The photomontages prepared by Aurecon for other wind farm sites have been compared with images of the installed wind farms in the landscape. In each case the visibility of turbines in the images taken after construction is less than shown in the photomontages used for the development applications. Aurecon's preference is to emphasise visibility in the photomontages.

3.3.15 Provision of additional photomontages

The Department of Planning, in its letter of 18th March 2009, requested that additional photomontages be prepared for four residence locations nominated in its letter. Prior arrangements were made with the owners of each of the four properties, or their representative, for Aurecon to visit the residence and collect the required photography. The location of the viewpoints was guided by the property owner preference and two photomontages have been prepared at each location. The details of photography taken and the photomontages prepared are provided below together with a description of the scenes shown in the resultant photomontages.

Additional photomontages for Highfields residence

A meeting was arranged with the landowner, Mr Phil Evans at the Highfields residence at 8am on 25th March 2009. Mr Evans indicated two locations for viewpoints from which he would like photomontages prepared. Due to the relative levels of the turbines and the residence site and distance between them a focal length of 35 mm was used to obtain the photography.

Photographic material was obtained for the following locations (see also photos below):

- Highfields – north eastern corner of yard – view to north west
- Highfields – south western corner of residence – view to south west
- Highfields – north western corner of residence – view spanning south west to north

The first location requested by the landowner was from the north eastern corner of the yard on the north eastern side of the residence. The selection of that location provides a clear line of site to ridges to the north west of the residence where turbines 10, 20B, 21B and 22B are to be located. The location to the northeast of the residence avoids screening by trees for views to the north-west from the residence's north-western corner. A photomontage was prepared for this location in the yard and is provided as Plate 1 of Appendix D. It shows a low visual impact of the wind farm for this viewpoint.

Highfields residence – locations of camera near residence for photomontage preparation	
	
In yard north east of residence (See Plate 1)	Near south west corner of residence (see Plate 2)

The second viewpoint requested was for the south west corner of the residence with a view to the south west and west. A photomontage was prepared for this location and is attached as Plate 2. A review of Plate 2 shows that a significant part of the tower of the closest turbine (T18) on the ridge to the southwest of the residence is screened by topography and trees on the ridgetop. It also appears that the landowners tree planting along the driveway near the house may provide future screening of the turbines to the southwest. The trees appeared to be a species (Pyrus) that is indicated to attain heights of 11 to 14 metres (see Appendix C1). An enlargement of part of Plate 2 (view toward T18 located at 1.03 kilometres) is provided on page 2 of Appendix C1.

Imagery was also obtained from the northwest corner of the residence but that has not been used to prepare a photomontage. The view from the northwest corner of the residence towards the turbines 10, 20B, 21B and 22B was more affected by tree screening.

Other items included in this report that assist the understanding of the setting of Highfields are Figure SR3 and Appendix C1. Overall the two photomontages prepared for Highfields demonstrate that a range of turbines can be seen for views from the southwest and the northwest but that tree screening is evident and the existing large trees are able to screen turbines of the scale proposed for the Glen Innes Wind Farm.

Additional photomontages for Cherry Tree residence

A meeting was arranged with the landowner for the Cherry Tree residence at about 9am on 25th March 2009. Mr Ashley Peake was present at the meeting and indicated the locations of the viewpoints from which he would like photomontages prepared.

Photographic material was obtained for the following locations:

- Cherry Tree – view from top of steps from verandah to yard near north east corner of house
- Cherry Tree – view from southern entrance to house view to south west
- Cherry Tree – single photos - views from driveway and Cherry Tree Road

The first location requested by the landowner was at the top of steps leading from a verandah at the north east corner of the residence to the yard on the northern side of the house. The camera was located on a tripod about 2.5 metres above the level of the yard at the base of the steps. A photomontage was prepared for the location using a focal length of about 60mm. This photomontage is attached to this report as Plate 3 of Appendix D and shows four turbines are visible from this point with one of these partly screened by topography. The major cultural element seen in Plate 3 is the large shed close to the residence. The power pole in the yard near the house also has a greater bulk that the turbines on the ridges in the distance.

Cherry Tree residence – locations of camera near residence for photomontage preparation	
	
North east corner of residence (see Plate 3)	South eastern corner of residence (see Plate 4)
	
Single photo taken – photomontage not prepared	View along driveway to Cherry tree residence

A second location requested by the landowner was the entrance alcove to the residence on its southern side and adjacent the driveway. The location does not appear to be a situation where persons would congregate but appeared important to the landowner as the principal entry to and exit from the residence. A focal length of about 60mm was also used for this location. This photomontage is attached to this report as Plate 4 (Appendix D) and shows five visible turbines with two prominent and three more distant and partly screened. Cultural features within the scene shown in Plate 4 include sheds, a large tank and a power pole which are all relatively close to the residence and have a significantly greater bulk than the turbines.

A third location in the driveway was used to obtain a single photo towards the south west and including the residence in the field of view as shown above. A photomontage was not prepared for this location

As can be seen in the two photomontages (Plates 3 and 4) prepared for the Cherry Tree residence a small number of turbines are visible in the respective views however the turbines do not conceal the existing landscape elements. Other cultural features such a sheds occupy more of the scenes for the respective viewpoints.

Additional photomontages for Mayvona residence

Phone messages were left with Mr Daniel McAlary to arrange a meeting in respect of gaining photographic material at the Mayvona residence. As he was unavailable at the time of the site visit on 25th March 2009 Mr Ashley Peake went to Mayvona and discussed locations for photography to be obtained. Mr Ashley Peake agreed to the locations of the viewpoints which are listed below.

- Mayvona – view from a location on southern side of house and 5 to 10 metres from the house
- Mayvona – view from a location on the western side of the house and within 5 metres of the house
- Mayvona – view from north eastern corner of house – single frame with view to north west

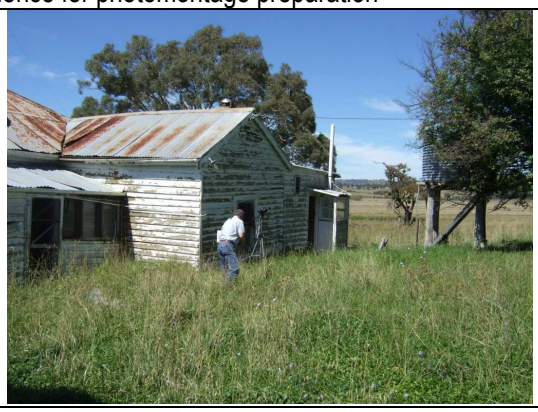
A photomontage was prepared for the viewpoint on the southern side of the residence and was generally toward the south west with the view to the west screened by trees at this point. This photomontage is attached to this report as Plate 5 (Appendix D). Three turbines are clearly visible with tips of two other turbines also visible. The turbines are not dominant elements of the scene.

A photomontage was also prepared from a viewpoint close to the western side of the house and provides filtered views to the turbines to the west and northwest. The photography used for this location was taken at a focal length setting of about 60mm with the camera tilted upward to ensure that the full height of the turbines was included in the imagery. This photomontage is attached to this report as Plate 6 (Appendix D). Tree screening affects three of the four turbines visible from this location.

Photography was obtained for a third location at the north east corner of the residence. A photomontage was not prepared for this viewpoint as a similar view is included in the photomontage prepared from the western side of the residence. The continuity of the viewfield from the north-western corner of the residence is interrupted by sheds close to the north-western corner of the residence.

Mayvona residence – locations of camera near residence for photomontage preparation

Southern side of residence (see Plate 5)



Western side of residence (see Plate 6)

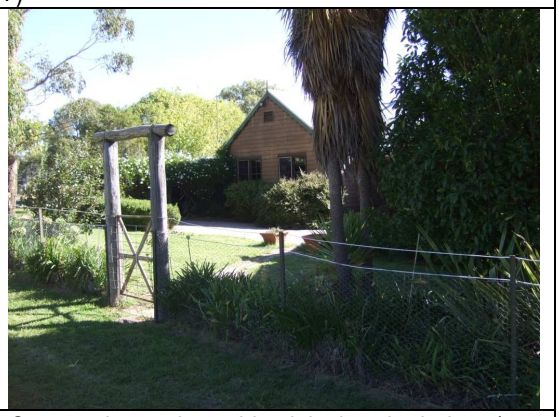
North-eastern corner of residence no photomontage prepared for this point as covered by Plate 6

Additional photomontages for Ilparran residence

The landowner for Ilparran, Mr Sam Crothers is not resident at the Ilparran property but lives and works in Sydney. Mr Crothers was contacted to arrange access for the purpose of obtaining the required photography. He suggested that photography from his kitchen window and from his driveway would be considered suitable. He also indicated that the residence is tenanted and provided contact details. The residence was visited on 25th March 2009 in the late afternoon when the sun was in a suitable position to obtain the photography with generally easterly views. Locations where photography was obtained are listed below.

- Ilparran A – View from outside gate at driveway entrance to yard – (35 mm focal length) - Plate 7
- Ilparran A – View from inside kitchen window looking east (digital camera) – no photomontage
- Ilparran A - View from outside kitchen window looking east (50mm focal length) – Plate 8
- Ilparran A – View to the east from outside kitchen window (35mm focal length)
- Ilparran B – View to east from north eastern side of vacant residence – no photomontage prepared

Photomontages were prepared for two viewpoints at the Ilparran A residence and are attached as Plates 7 and 8 (Appendix D). Due to the number of mature trees at the residence location there will be significant tree screening of the wind farm as indicated in Plates 7 and 8. A range of shrubs at the residence complement screening by the large trees. While the mature trees at the residence will provide significant screening of respective turbines it will be possible to gain views to the respective turbines by moving to different viewpoints at the residence location. Turbine sites that are closest to the Ilparran A residence are Sites T16C, T17, T13B, T15, T16B and T13 all of which are within 2 kilometres of the residence.

Ilparran residence – locations of camera near residence for photomontage preparation	
	
Camera located outside gate to driveway (see Plate 7)	
	
View to the east from inside kitchen window – no photomontage from inside residence	Camera located outside right hand window (see Plate 8) – Tripod and camera not in photograph

Analysis of the photomontages shows that while a small number of turbines will be prominent for each of the viewpoints they do not overwhelm or mask the existing scenes. More distant turbines are screened by topography. Small changes in the viewpoint at this residence will affect which turbines are visible at the particular viewpoint location.

3.3.16 Conclusions in relation to responses relating to visual impact

The visual impact of the proposed wind farm was an issue raised in a significant proportion of submissions from the local community and is considered as a key issue of concern for neighbours. In particular, residents of the Furracabad Valley have described the area as a quiet and scenic place that would be transformed to an industrial landscape. The Furracabad Valley is undoubtedly a pleasant

rural setting but it has not been subject to classification at a National, State or Regional scale as an area of high scenic value requiring protection. Additionally, wind farm development does not constitute a prohibited development for the relevant zoning.

Throughout the world the development of wind farms has been occurring at very high rate and many European countries have significant integration of wind farms in their electricity generation systems with wind turbines being widely introduced to many landscapes.

The various matters raised in respect of visual impact have been reviewed by the proponent and responses to the matters raised have been provided in this section. Overall the proponent believes that:

- the Environmental Assessment was supported by a comprehensive Visual Impact Assessment that describes the visual impact of the wind farm and the mitigation measures that will be incorporated.
- the wind farm will be visible over a broad area but is a modest scale wind farm development even if some neighbours would believe it particularly intrusive
- the scenic qualities of the local area will still be present for view points in the local area despite the wind farm development.
- no neighbouring residences will be surrounded by turbines and all will still have a significant part of their outlook not affected by wind turbines
- criticism by neighbours that insufficient photomontages were provided is noted but those provided in the Environmental Assessment do appear to have enabled neighbours to understand the form of the development. The Department has requested an additional four from residences close to the wind farm and these are provided with this submissions report. A review of the additional photomontages shows that the turbines are visible but does not indicate that the wind farm is an overwhelming part of the scenes for the four residences.
- review of the additional photomontages (Plates 1 to 8) supports the description of the turbines being prominent rather than dominant. In the case of Cherry Tree, the built structures such as sheds located close to the residence are far more dominant parts of the view from the residence locations used for the preparation of the photomontages shown in Plates 3 and 4.
- the mitigation measures involving the offer of tree screening at neighbouring residences within three kilometres of the wind farm would mitigate the wind farm visibility should the owners wish to take up the offer. A number of respondents have suggested that such screening is inappropriate but it appears that many already have screening of the form being offered. The acceptability of such screening as a mitigation measure will be an individual decision by the landowner and where requested the proponent will provide screening for impacted residences within three kilometres of the wind farm.
- representatives of the Department have made visits to the wind farm site and selected neighbouring residences to acquaint themselves with the issues of concern to neighbours that have objections to the wind farm as part of the project review and decision making process.

Overall the visual impact is assessed as not being overwhelming with the closer neighbouring residences having some views that include a part of a modest scale wind farm development and where the residences will still have a significant part of their viewfield that does not include wind turbines in the viewfield.

3.4 Noise Impact

A range of submissions have been received in relation to the potential noise impacts of the project on the neighbouring community surrounding the wind farm site. The submissions include comments by the Department of Environment and Climate Change NSW (DECC) and a range of matters raised by the local community. Some respondent's submissions raise the issue of noise disturbance and potential for health effects. The proponent's comments in relation to potential health effects are provided in section 3.5.

The respondent issues are discussed in the following sections and include the following matters.

- DECC submission general comments
- DECC comment in relation to the substation transformer noise
- DECC comments on compliance with the SA EPA Environmental Noise Guidelines
- DECC comment on construction noise management plan
- Glen Innes Severn Council DCP – Wind Power Generation
- General aspects of responses by neighbours in respect of noise impact
- Noise environment and impact on neighbouring residences
- Noise not exceeding amenity criterion but may be audible at times
- Noise nuisance ignored by noise assessment
- Different noise environment on ridges and in valleys that has not been assessed
- Infrasound
- Conclusions in relation to noise assessment and impacts

3.4.1 Department of Environment and Climate Change submission

The Department of Environment and Climate Change NSW (DECC) has been involved in the planning process since the Planning Focus Meeting in January 2007. Following that meeting DECC provided comments on the assessment requirements to be considered in forming the Director-General's requirements. The draft Environmental Assessment was referred to DECC by the Department of Planning in first half of 2008 and comments were made to the Department of Planning which subsequently forwarded them to the proponent. The Environmental Assessment was subsequently amended by the proponent before being accepted by the Department of Planning as suitable for public exhibition.

On 22nd December 2008, the DECC responded to the Department of Planning in respect of its review of the publicly exhibited Environmental Assessment. The DECC's response in relation to noise issues is described here and proponent responses provided.

The DECC noted that Electricity Generating activities that utilise wind power are no longer categorised as scheduled premises under the Protection of the Environment Operations (POEO) Act 1997 and do not require an Environment Protection Licence (EPL). It also follows that DECC is therefore not the appropriate regulatory authority (ARA), under the POEO Act, to regulate activities at the premises if approval is granted. In such instances this role could be taken up by local Council however it is expected that the Department would have a role in ensuring that the project is implemented in accordance with the Minister's Project Approval conditions.

The DECC response noted that overall the noise impact assessment appeared to meet the 2003 South Australian Wind Farms: Environmental Noise Guidelines and incorporated the (DECC) comments raised from the adequacy check and letter submitted to the Department of Planning (letter dated 2nd May 2008). However some additional comments were provided as described below.

3.4.2 DECC comment in relation to substation transformer(s)

DECC response - The noise impact assessment indicates a criterion of 34 dBA $LA_{eq, 15min}$ which is below the minimum specified in the Industrial Noise Policy. DECC advises that noise criterion from the transformer substation be limited to 35 dBA $LA_{eq, 15min}$ at the nearest noise sensitive receiver location, free of tones or other annoying characteristics, under adverse meteorological conditions.

The DECC's recommendation included in its response is considered by the proponent as suitable in its current form and as repeated below.

Recommendation: Noise limits for the transformer sub-station should be set at a noise criterion of 35 dBA LA eq, 15min in accordance with the Industrial Noise Policy (INP). Modifying factors should be applied in accordance with the INP if this is demonstrated to be an issue with operation of the facility.

3.4.3 DECC comment on compliance with South Australian EPA Noise Guidelines

The DECC notes that the Environmental Assessment indicates that where noise criterion are exceeded by the noise from the operating turbines then the criterion can be met by modifying the operational mode of the selected turbines. The DECC questions whether modelling has been undertaken to demonstrate compliance as the Environmental Assessment does not provide predicted noise levels following attenuation through modifying the operating mode.

The proponent has undertaken analysis to assess which turbines of the 27 turbine V90 3MW array need to be operated in a modified mode to achieve compliance with noise amenity criterion at locations where exceedances would otherwise occur. However, while further modelling could be done such modelling may not be indicative of the final form of the installed array. The proponent notes that it is still deliberating over the actual wind turbine equipment to be used and the total number of turbines to be installed. The Environmental Assessment has been based on a worse case situation and has shown slight exceedances that can be readily managed by adjustments to turbine operating modes. It is considered more appropriate that the final design be subject to modelling to confirm the predicted noise levels of the design are compliant.

The DECC's recommendations in relation to the proposal are set out below:

- ***The proposed noise compliance assessment protocol should ensure that validation monitoring includes all relevant rated wind speeds where noise impacts may occur and the range of stability class conditions expected at sensitive receptors. This may require a longer assessment period than 3 months to account for potential inversion/stable conditions during evening/night time periods in winter months in particular.***
- ***If the turbines are relocated and/or different turbine types are proposed to be used during detailed design, the proponent should undertake additional noise modelling to demonstrate compliance with noise criterion prior to construction.***

While the DECC has indicated a possible compliance assessment period of more than 3 months the duration of the assessment should be subject to advice from a noise specialist based on the results being obtained, the meteorological conditions occurring during that time and the significance and need for undertaking further assessment in the context of potential impacts that could occur relative to the initial results.

The proponent accepts that it is reasonable to provide results of noise modelling and compliance with noise criterion based on the wind farm final design once details have been confirmed and prior to commencing construction of the wind farm. It is also expected that this would not alter the criterion values that have already been determined in accordance with the SA EPA guidelines.

The DECC has also sought a sensitivity analysis of developing noise criteria based on 10 metre wind speed versus hub height wind speeds. This was not undertaken for the publicly exhibited Environmental Assessment as both the noise amenity criterion and the predicted wind farm noise levels are based on 80 metre high wind speed data. It is noted that redrafting of the New Zealand Standard 6808 has also moved towards use of hub height wind speeds. This position appears to be well accepted with the availability of much more wind speed data for hub heights than was formerly the case when 10 metre data was more common. It also avoids the issue of uncertainty in adjusting 10 m wind speed data to hub height data and in the case of Glen Innes Wind Farm proposal 10 metre data is not available for the existing monitoring masts and would require calculated values that would be appropriate.

3.4.4 DECC comment on Construction Noise Management Plan

The DECC also made comment on their role in respect of approvals for blasting as follows.

The DECC stated that reference is made on page 13 (of the proponent's Statement of Commitments***) that modification of proposed blasting hours will require the approval of DECC. DECC in this instance does not regulate construction activities as part of a scheduled development works/ scheduled activity licence.***

DECC Recommendation: Remove reference to DECC as approval body for blasting.

The proponent has modified the Statement of Commitments to remove reference to the DECC as the approval body for blasting and replaced it with reference to the Department of Planning.

3.4.5 Glen Innes Severn Council DCP – Wind Power Generation

***Respondent (A1) statement* – The Glen Innes Severn DCP – Wind Power Generation includes requirements in relation to noise assessment.**

The Glen Innes Severn Development Control Plan (DCP) Wind Power Generation was developed during the period that the Environmental Assessment was being prepared. The DCP became effective from 28th May 2008 which was after the submission of the Environmental Assessment to the Department of Planning, which occurred in March 2008. The guidance for the Environmental Assessment was the Director-General's requirements that were issued in May 2007 under Part 3A of the EP&A Act. While the DCP is not directly applicable to the process undertaken for the Glen Innes Wind Farm, many of the requirements in relation to noise assessment have been addressed by the Environmental Assessment. Responses to comments, mainly those from the local community in relation to specific aspects of noise impacts, are discussed in the following sections.

3.4.6 General aspects of responses by neighbours in respect of noise impact

Respondents have noted that background noise levels for the rural areas are low and based on their review of the noise assessment indicate that they expect that the wind farm will at times be audible even when applicable noise amenity criteria are not being exceeded. One submission states that; "*There is no doubt that whatever the level of environmental noise, except perhaps at wind speeds, the 'background' noise environment and character of the southern end of the Furracabad Valley will be permanently altered*." The view taken in that submission is considered extreme and appears to be influenced to some extent by the view of the Glen Innes Landscape Guardians that the wind farm is going to change circumstances significantly for occupants of the Furracabad Valley. The group's reference to a selection of web based articles highlighting adverse effects can only heighten their anxiety. On balance there have been many wind farm projects advanced that have not resulted in such dire outcomes as a number of the Furracabad Valley respondents are suggesting. Furthermore the proponent is aware that many wind farm projects that have experienced local community objection at the planning stage have been accepted or not subject to complaint once installed and operating.

A review of the issues raised by the various submissions is provided below.

3.4.7 Noise environment and impact on neighbouring residences and valleys

A number of the neighbours to the wind farm site have indicated the low ambient background noise levels for the Furracabad Valley rural setting and indicated that they are expecting a significant change in the amenity of the locality due to noise from the wind farm. These are discussed below.

Respondent (C1) Statement - Background noise levels at our home are very low – lower than at many other rural locations. This means that turbine noise can exceed background noise which may be only 20 dB or lower.

The background levels at the respondent's residence are likely to vary widely with circumstances at the time and particularly with wind speed. As the wind speed increases the background noise levels also increase as is indicated in the Environmental Assessment.

The instruments used for the background monitoring met the requirement of the South Australian (SA) EPA guideline which was the principal reference for the background monitoring. The instrumentation for the respondent's Cherry Tree (Eungai) residence recorded values of background noise at or above 25 dBA and 3,128 measurements recorded during the approximately four week period were used for the noise assessment. Values recorded for Cherry Tree were mostly below 45 dBA and above 25 dBA with just a few isolated values in the range 55 to 65 dBA.

Where the regression level is below 30 dBA then the amenity criterion is set at 35dBA. Even if the instrument had a lower noise floor and recorded lower noise values at the low wind speeds which had drawn the regression line down, that would not have changed the derived noise criterion for the integer wind speeds from 4 to 9 metres per second as the criterion was set at 35 dBA. At higher wind speeds above 9 metres per second, there is a lower likelihood of the background noise level being less than 25 dBA and the regression presented in the Environmental Assessment is considered a reliable source to derive the noise criterion for speeds greater or equal to 10 metres per second.

The respondent's comment that background noise level may be 20 dBA or lower is likely to be correct for only a very small part of the time and most likely when wind speed is very low and stable atmospheric conditions are present. At such times it is most likely that the wind turbines will not be operating. The cut-in speed for the turbines is about 4 metres per second but can vary slightly with the turbine used. No criterion is developed for wind speeds less than the cut-in speed as these are not relevant.

Even when wind speeds are low, noise other than from the wind farm such as distant sound of vehicles, a pump or generator operating, stock or insects can contribute noise that will increase the ambient noise levels. Cicadas can generate noise levels of 60 to 80 dBA at residences and crickets and stock can also contribute significant amounts to measured noise levels. After discussion with the residents at Cherry Tree, the noise monitoring instrumentation was purposefully located on the opposite side of the house away from a pump indicated to be located in a shed to the west of the house.

Whenever the wind farm noise at the residence exceeds a background noise level of 20 dBA, but is less than 35 dBA the wind farm will be below the minimum criterion for the project and below criterion levels used for rural areas of NSW. As such the wind farm noise level would be considered as being below the level where the wind farm operation needed to be regulated. While this aspect appears to be of concern to some members of the Furracabad local community it is the generally applied minimum criterion in many instances for NSW and is taken by noise specialists and regulators to be a level that provides an acceptable protection of noise amenity.

Respondent (C1) Statement – The SA Guidelines 2003 could possibly not be exceeded but this doesn't mean that we won't hear the turbines or that this noise will not be a nuisance particularly given our quiet location.

Predicted wind farm noise levels indicated that the criterion developed in accordance with the process outlined by the SA EPA Noise Guidelines will not be exceeded at most neighbouring residences. Several instances of exceedances have been predicted by the noise modelling based on the noise specification for the Vestas V90 3MW wind turbine. This turbine has been used for the noise assessment as it represents the turbine with the highest noise levels for the turbines under consideration for the project. Several options are available to the proponent to avoid exceedances being realised and the final design will need to enable compliance with the criterion values.

Audibility is not the criteria proposed for wind farm operation. Audibility does not provide a useful measurable basis for compliance assessment and the SA EPA Environmental Noise Guidelines provide criterion that can be tested and that have been developed to provide adequate amenity protection.

Respondent (C1) Statement – Teague and Foster in "Acoustic Assessment of Wind Farms – a practical approach (2006) state that it is important to have low noise floor equipment (<20dBA) for measuring low background levels at "quiet rural sites". Noise floor of the instruments used at Eungai (Cherry Tree) was limited to 25-27 dBA even though the Environmental Assessment states that "instruments with a low noise floor would have been desirable".

It is noted that Teague and Foster of Vipac have undertaken background noise assessments where they have used instruments with similar noise floor to those used for the Glen Innes Wind Farm background noise monitoring and in some cases higher than used for the Glen Innes Wind Farm noise assessment. While low noise floor instruments are generally sought for logging, such instruments are not always available at the time logging occurs.

Type 1 Noise Loggers with a noise floor of 25 – 27 dBA were used. The SA EPA Guidelines only specify that noise monitoring equipment be of at least Type 2 certification and the instruments used for the background monitoring complied with this requirement. Also, given the criterion is limited to no less than 35 dBA and that the instrument noise floor was up to 10 dBA less than this and for reasons given above, the noise floor is not considered to have significantly affected the analysis used to determine acceptable criteria for receiver locations.

When these factors described above are taken into account the noise floor of the instrumentation is considered adequate for the purpose as well as complying with the requirements of the SA EPA Environmental Noise Guideline for Wind Farms.

Respondent (C1) Statement – Teague and Foster in Acoustic Assessment of Wind Farms – a practical approach (2006) also state that "extreme wind profile effect and the phasing of numerous turbines cyclic variations could cause audible modulations that could be clearly discernible above the background for some distance".

The statement of Teague and Foster was made in 2006 and prior to that company having gained substantive experience in the noise characteristics of operating wind farms. The statement that has been selected by the respondent is not definite in respect of the impacts. Peter Teague is also understood to have been a contributor to the development of the SA EPA Wind Farm Noise Guideline and involved in their ongoing review.

It is noted that the Glen Innes Wind Farm is a small to moderate scale wind farm where only six turbines are immediately adjacent to the Furracabad Valley. The more westerly turbines are set back further from the Furracabad Valley and in some cases will have substantial ridges between the turbines and the Furracabad Valley. This situation is likely to reduce the potential for effects such as

amplitude modulation to have a significant impact for the respondent's residence and others in Furracabad Valley.

It is noted that the University of Salford undertook a review of 133 wind farms in the UK (Research into Aerodynamic Modulation of Wind Turbine Noise July 2007). The report found that there has been little research into amplitude modulation and causes are still subject of debate. Amplitude modulation was assessed as not fully predictable at the current state of the art. Overall, the report found that the incidence of amplitude modulation of aerodynamic noise is low. Amplitude modulation was considered to be a factor in four of the 133 sites reviewed by the University of Salford study and a possible factor in another eight. In only one case was the wind farm regarded as a statutory nuisance. Complaints are indicated to have subsided for three out of the four sites, in one case as a result of remedial measures to the wind farm control system. In the remaining case, investigations were indicated to be continuing. It is also noted that changes to the operation of the stall regulated turbines of the Te Apiti Wind Farm in New Zealand have been indicated to have resulted in reduced noise impact from the wind farm.

This aspect did not form part of the Glen Innes Wind Farm assessment requirements and has not been addressed by the Environmental Assessment. In the unlikely case that amplitude modulation presents a concern once the wind farm is installed then the issue and associated impacts from the wind farm would need to be investigated and resolved.

Respondent (C1) Statement – This (previous statement by respondent) is echoed in Peter Fearnside's presentations to AUSWIND 2004 regarding acoustic anomalies that "at times synchronous addition of turbine noise can result in an impulsiveness that is not observed close to turbines."

Refer to the previous proponent response including reference to the University of Salford's UK study into amplitude modulation of aerodynamic noise.

Respondent (C1) Statement – Problems with our noise assessment (Cherry Tree (Eungai) include a failure to provide separate day and night analysis and the consultant failing to notify us of the need to record instances of unusual background noises as is best practice.

The assessment includes review of all data in accordance with the procedure set out by the SA EPA Guideline that form part of the Director-General's assessment requirements. In addition, detailed assessments have been provided for various stability characteristics and which goes beyond the detail provided in most other NSW wind farm noise assessments. The issue of extraneous noise was discussed with the residents at the time the monitoring equipment was installed and the site selected was on the opposite side of the house to pump equipment that contributes to the background noise at this location.

Respondent (C1) Statement – Noise criteria are exceeded at nearby Mayvona and Highfields and given our low background noise the uncertainty of noise modelling and the possible phasing of the banks of nearby turbines we remain extremely concerned about the nuisance noise impact of this proposed wind farm.

The exceedances identified in the noise impact assessment are limited to specific integer wind speeds and only slightly exceed the criterion applicable for the same wind speeds. As the exceedances are minor, it is possible to modify the operation of the wind farm to reduce the noise levels occurring at the neighbouring properties so that the operation complies with the criteria developed in accordance with the South Australian EPA Noise Guidelines. For each residence there is only one turbine within one kilometre of the residence site. For Mayvona, the closest turbine is at 0.85 kilometres and for Highfields the nearest turbine is at 1.03 kilometres (previously indicated as 0.96 kilometres. All other turbines are beyond one kilometre and successively more distant from the residence sites.

In terms of the uncertainty of the noise model, the acoustic consultant has used the selected ISO 9613-2 model as being one of the better predictors of noise impacts for wind farms. Details of the model selection ISO 9613-2 over the more conservative CONCAWE model and parameters used for the model are discussed in Section 8 of the Noise Assessment.

Reviews of the CONCAWE and ISO 9613-2 models have shown the improved accuracy of the ISO 9613-2 method. In particular, Bass et al (1996) notes "*..The accuracy of output from the ISO model is impressive. Agreement with sound pressure levels measured under conditions of an 8 m/s positive vector wind speed has been measured to within 1.5 dBA on flat, rolling and complex terrain sites. The only observed exceptions to the excellent accuracy achieved by the model occur in the presence of marginal or partial acoustic screening, and also where the ground falls away significantly between the source and receiver. However, these two situations are easily accounted for by means of simple correction factors.*"

The noise assessment indicated the suggested correction factors and that these corrections have been included in the model and have accounted for less than a 0.5 dBA increase in the noise level at receivers. The analysis method used was ISO 9613-2 with inclusion of meteorological effects for considering barrier (eg terrain) attenuation and ground absorption, as opposed to CONCAWE.

The noise assessment also indicates that there is research in New Zealand/Australia that has also been shown recently to provide more accurate estimates of emissions from turbines, though it was based on worst case downwind noise propagation with a "well developed moderate ground based temperature inversion" as used by ISO 9613-2 (reference clause 5). It is also understood that for the review of the draft New Zealand noise standard NZS 6808 it is proposed that the simple prediction model that was permitted in the current noise standard NZS 6808 has been removed and replaced with calculations based on ISO 9613 that uses octave-band calculations (rather than a weighted average) and allows for a wider range of factors regarding sound propagation.

Despite the accuracy offered by the model used, the proponent in developing the final design will nevertheless need to take into account a small degree of uncertainty for the noise model such that compliance with approval conditions (the relevant noise amenity criteria) can be confidently assured. To do otherwise would represent a significant risk to the proponent.

Respondent (C1) Statement – Our concern is heightened by the downgrading of the role of the DECC in the monitoring of noise impacts and the responsibility falling to the local council which is inexperienced in this area.

Where the Minister has been the determining authority the Department of Planning is also expected to maintain a role in overseeing compliance with Project Approval conditions. It is understood that the DECC can also be called on by the Department for advice in specialist matters relating to noise impacts, should that be required. Overall it is anticipated that the Project Approval conditions are enforceable by the Department of Planning.

Respondent (C1) Statement – The proponent's noise consultant acknowledges publicly that we will hear these turbines because of our low background noise levels. The peace and quiet of our tranquil rural setting will be changed forever.

The noise consultant indicated that the turbines will be heard at times even where below criterion levels however this does not extrapolate to the respondent's view that the peace and quiet of our tranquil rural setting will be changed forever. Background noise monitoring has shown a different picture of the ambient noise characteristics than is purported to be the case by the respondents.

Another neighbour (owner of Wandsworth) has also raised the question as to whether birds will still be heard around the homestead over the noise of wind turbines. The same noise consultant referred to by respondent C1 has indicated the sound of birds will still be heard over the sound of wind turbines.

Respondent (C5) statement – The possibility of receiving irritating audio noise generated by the wind farm that is over and above the normal background noise. We feel this will occur during strong westerly winds which would carry the noise to our residence.

The respondent is some four to five kilometres from the wind farm and it is expected that their concern has been influenced by other neighbours in the local area highlighting web-site articles that are not necessarily reliable sources of information. The respondent's residence is also positioned very close to large trees which will increase the background noise levels at this location. Based on the distance from the wind farm and the presence of large trees near the residence the respondent is very unlikely to experience any noise impact from the wind farm.

Respondent (C9 & C10) statements - Predicted turbine noise will exceed criteria at both Highfields and Mayvona and the only guaranteed method of avoiding this exceedance is turbine removal.

The noise assessment has predicted only minor exceedance of criteria at specific integer wind speeds. As such, it is possible to control turbines so that exceedances can be avoided. The assessment has been based on the Vestas V90 3MW wind turbine and in the event that an alternative turbine is selected with a lower noise specification then the exceedances may be avoided or reduced in extent. In turn this may negate the need to apply controls to limit turbine operation or could reduce the amount of time that the operation needs to be constrained. The issue of turbine selection is still subject to review by the proponent and is rarely finalised prior to gaining planning approval and the subsequent award of contracts.

While installation of a lesser number of turbines may ultimately be possible for the final design its viability has not been confirmed and the proponent wishes to seek approval for a 27 turbine noise compliant array but has not ruled out the option to develop a lesser scale project if that is proved viable.

Respondent (C9 & C10) statement's – Because of very low background noise levels in the Furracabad Valley other residents will also hear turbine noise within the noise environment.

The wind farm may be audible at times at some locations even though the wind farm noise levels are below criterion levels. With distance the noise levels are likely to be well below criterion and background levels and a non-issue.

Respondent (C11) statement – It has been documented from other countries where wind farms have been constructed that a group of turbines create low frequency 'beating' noise under certain conditions (often at night) causing considerable nuisance to nearby residence. It has been likened to the sound of drums and as it is a low frequency wave length, it is difficult to mitigate.

Some incidence of annoyance have occurred for some wind farm sites and it appears that such instances apply to a small number of wind farm developments and that modifications to wind farm operation can reduce or avoid the impact.

One such case is Te Apiti Wind Farm in New Zealand where problems were indicated and the problem was linked to the stall regulated rather than the more common pitch regulated turbines used for modern wind farms. It is understood that the operator Meridian Energy has been able to address this situation by shutting down these turbines at the times when the particular noise effect would occur.

In the UK, a review of 133 wind farms was undertaken by the University of Salford in respect of an effect referred to as amplitude modulation that is sometimes referred to as a source of disturbance.

The report on the study found that the incidence of amplitude modulation is low. In only one of the 133 wind farms studies was amplitude modulation regarded as a statutory nuisance.

Respondent (C13) statement – Farmers do not remain indoors all day with the windows and doors of their homes firmly closed but traditionally work outdoors from dawn to dusk. Obviously, the noise of the wind turbines, at times, would be extremely intrusive.

It is understood that the respondent owns property, including the residence Klossie, adjacent to, and to the south of the wind farm. The respondent is understood to be resident in Sydney and the residence is occupied by the property manager's family. For the reasons below, the proponent does not expect that the noise of the wind farm will be regarded as '*extremely intrusive*' to farmers that are working the land.

It is generally the situation that when farmers work outdoors they are active and may be working with stock and sheep dogs or using vehicles such as two or four wheel motorbikes, four wheel drive vehicles and/or trucks and tractors and plant and equipment such as harvesters, posthole diggers and a range of other equipment. Under such circumstances the proponent expects that the farmers will not be concerned by any wind farm noise as it is likely to be quieter than the activities that they are engaged in. Many farmers are also very practical people and we have found that those who work the land are generally quite accepting of the wind farms as a practical utilisation of an available resource at the locality that does not limit the agricultural productivity of the local area.

Respondent (C14) Statement – By the proponents own admission, noise levels at our home "...it is predicted that the criteria would be exceeded for short periods at this (our) location if the Vestas V90 3MW turbines were used in an unconstrained operational mode. Exceedance of noise criteria of up to 1 dB (A) has been predicted for short periods at Highfields and may require a constrained operation of selected turbines to ensure compliance...." Pg.ES-11, Volume I. If so, why are these turbines allowed to be only 0.96kms from our home and surrounding it by at least 8 turbines within 2km and 15 within 3km? Does this noise then reverberate and magnify to ensure that this criterion is exceeded regularly?

The modelling that has been done takes account of all the proposed turbines including those beyond 2 kilometres. It is expected that any project approval will require compliance with the relevant criteria rather than permitting the respondent's indicated situation of regular exceedance of criteria. The Department has also demonstrated that it takes a role in overseeing the compliance with Project Approval conditions of the Minister for Planning.

Respondent (C14) statement – Similarly, on Chapter 10-2 Volume I of the Environmental Assessment, the proponents claim that "the proposed layout has been designed to achieve acceptable impacts at neighbouring residences primarily through ensuring sufficient setback of turbines from the closest residences.....to ensure that the selected layout enables compliance with noise level criteria.." By their own admission, this has NOT been done.

The modelling indicates that unconstrained operation for the assessed layout and equipment may result in exceedance at certain times. The assessed turbine arrangement was presented as the worse case noise impact situation and the proponent has the ability to implement a lesser impact design and/or to vary the operation of certain turbines to ensure compliance. It is the proponent's intention that the wind farm operation will be compliant due to adoption of one or more of these options for the installed array and that the wind farm operation will be subject to noise compliance assessment. Inability to comply with the respective noise amenity criteria would represent a significant financial risk for the proponent and the wind farm final design will give close attention to achieving compliance.

Respondent (C14) statement – The response of the proponent to this problem is "The location of Turbine 18 has been moved marginally south from its initial design location to increase the separation distance between the turbine and "Highfields" and reduce visual and noise impacts"

Chapter 10-3, Volume I. What the proponents fail to say is that they have inserted an extra turbine, 16B which will effectively DOUBLE the noise levels at our home.

Turbine 18 has been moved south to be more distant from the occupied Highfields residence. Not only does this marginally increase the separation distance it also places the turbine back beyond the lip of the ridge-top above Highfields residence.

In the case of Turbine 16 B it is an additional turbine on a small knoll that is additional to the turbines shown in the 22 turbine layout that was presented for the Preliminary Environmental Assessment. However, the respondent statement is wrong in claiming that the insertion of Turbine 16B "will effectively DOUBLE the noise levels at our home". Turbine 16B is about an additional 400 metres more distant from Highfields than is the case for Turbine 18. The impact of turbine 16B on predicted noise levels at Highfields does not double noise levels at the residence.

Respondent (C14) statement – Why does the proponent go on at length, on following SA EPA Guidelines and World Health Organisation noise amenity guidelines for the wind farmer (non-relevant) residences and totally disregard the fact that these guidelines will not be used for residences that are not receiving financial remuneration. See Chapter 10-3 paragraph 6, Volume I.

The SA EPA guideline criteria have been applied to the respondent's residence and are more stringent than the criteria being applied for the wind farmer residences.

Respondent (C14) statement – Please refer to Table 10.5 & 10.6 (Chapter 10-13 & 10-14) and try to explain WHY consideration is given to a vacant house, in disrepair, owned by a wind farmer and NONE is given to a family who are living with noise levels equal to it?

The Hillside residence is closer to turbines than Highfields and is the only residence in the vicinity of the wind farm that can genuinely be described as being surrounded by turbines. The Hillside residence will have a greater potential for noise exceedance than would be the case for Highfields.

There is no greater consideration given to the Hillside residence than for the Highfields residence and the proponent does not intend to vary the wind farm operation in respect of impacts for the Hillside residence. The agreement that will be established with the wind farmer is in recognition of the fact that noise levels may exceed criteria that would otherwise be applicable for a neighbouring residence such as Highfields. The purpose of the agreement is to ensure the wind farmer has been alerted to the levels that will occur for the residence and accepts the situation essentially agreeing to an exceedance.

Respondent (C14) statement – Why will the proponents enter into an "....agreement with an owner for the purpose of addressing noise exceedance at a non relevant residence needs to describe the nature of the predicted noise impact so that the potentially affected landowner understands the issue and can take that into account when consenting to the development." Chapter 10-14, paragraph I, Volume I. WHY HAVE WE NOT BEEN EXTENDED THE SAME COURTESY?

There appears to be a misunderstanding of the different way that a neighbouring residence and a wind farmer residence are treated. In simple terms, compliance with noise amenity criterion must be achieved for the neighbouring residence. However, the wind farmer's Hillside residence may be subject exposure to wind farm noise levels above the criterion values, if the wind farmer landowner agrees to noise exceedances. Such agreement with the windfarmer landowner needs to be demonstrated by the proponent.

Respondent (C14) statement – When the noises levels are exceeded, the Glen Severn Council will be the regulatory body, how will they be shutting down the turbines to adhere to noise guidelines? They at this stage have no idea what they will do.

The Minister for Planning is the approval authority and the proponent expects that the Department's compliance section will have a role in ensuring that approval conditions are met including the requirement for noise compliance. Noise compliance is likely to be assessed in the early stages of the wind farm's operational phase and any exceedance of criteria would require variation to the wind farm operation to achieve compliance.

Respondent (C14) statement – No assessment of the noise environment for the circumstances where there is enough wind speed on the ridge to operate the turbines, yet at our place further down the hill, it is still. This happens on a daily basis. This omission only indicates one thing, a lack of veracity on behalf of this report.

The respondent statement is incorrect as described in the following.

The background noise criteria have been developed using background monitoring data that was obtained at residence locations in the valleys and in the case of Highfields on a slope between the valley and the ridges. The background noise data was correlated with wind speed data for the meteorological masts on the ridge tops and for heights of 80 metres simulating the turbine hub height. In this manner, the amenity criteria are developed in respect of wind speeds for the hub height which is also used as the reference for the turbine sound power levels that are used by the modelling.

At very low wind speeds at Highfields it is also possible that wind speed at hub height at turbine sites may be less than the cut in speeds for the turbines and accordingly the wind farm will not be generating and noise impact of the wind farm does not present an issue.

Respondent (D1) statement – The Environmental Assessment does not include a figure that displays background noise levels for comparative purposes. Similarly, the limited number of monitoring stations and the short duration of background noise level monitoring are considered totally inadequate.

The respondent's residence is in Wellingrove Valley at a distance of greater than 3 kilometres and is well beyond the distance where the detailed background monitoring is needed to assess compliance. The period for noise monitoring exceeds the requirement of the South Australian EPA Environmental Noise Guidelines. The residences selected for noise monitoring provide a range of circumstances. It is noted that there is only a small difference in background noise levels at specific integer wind speeds between the four respective monitoring sites.

3.4.8 Noise not exceeding amenity criterion but may be audible

Respondent (C9 & C10) statement's – The fact that a sound can be discerned and identified by a sensitive receiver within the general background noise can be sufficient aggravation and cause undue stress and other negative impacts on the receiver. The human ear is particularly adept at discriminating and identifying noise sources within a total environmental noise.

The noise generally associated with wind turbines is less harsh than many other industrial noise sources and is more closely related to noise of the wind and the sea. Even standing underneath turbines many people remark that it is not difficult to hold a conversation. At distances of a kilometre the turbine noise is considerably reduced. Where a person is outdoors the wind blowing past their ears may also partly mask any noise from the wind turbines. Indoors there is the acoustic barrier provided by the building structure.

With any subtle noise source that a person focuses on it is possible that there could be an annoyance even though the level may be below amenity criteria. This circumstance is not unique to wind farm projects and may apply to many other development projects. A person that is affected in this manner may choose to ignore the source, find a means to screen it out or may be further annoyed and request

that the operator address their concern. Where a neighbour indicates annoyance from the wind farm operation, then the proponent is committed to liaising with the neighbour to understand the nature of the concern and to investigate whether practical assistance can be provided to resolve matters that are assessed as unreasonable disturbances. The Operational Environmental Management Plan shall incorporate procedures to provide for these matters to be addressed.

Respondent (C9 & C10) statement's - The fact is the turbines will be heard within the noise environment even if they are simultaneously meeting regulatory noise guidelines. Also there are effects due to changes in wind direction and harmonic effects as turbines take up new directions (similar to the harmonics experienced when the engines of a twin-engine aircraft are out of synchronisation, a sound experienced by many passengers). None of these have been addressed in the Environmental Assessment.

The noise modelling for the Environmental Assessment has assessed the worse case wind direction situation for each residence at the maximum sound power level for the turbines and provides the cumulative level of predicted noise from all the contributing turbines.

The Environmental Assessment has not tried to compare the effects with those of twin engine aircraft where passengers are seated between the two closely spaced engines. The aircraft engines have a much higher rotational speed and different aerodynamic characteristics as the plane moves through the sky. The analogy provided by the respondent may be one with which they are familiar but is not considered a particularly good reference for assessment of the Glen Innes Wind Farm.

3.4.9 Noise nuisance ignored by the noise assessment

Respondent (C9 & C14) statement's – The very effect of noise "nuisance" has been ignored in the Environmental Assessment which casts doubt on the validity of the research.

The noise assessment provided in the Environmental Assessment has utilised the SA EPA Guideline for assessment of noise from wind energy facilities. In addition, the Director-General's requirement to consider atmospheric stability has also been taken into account. The noise assessment has included the derivation of noise amenity criterion relevant to the proposal in accordance with the accepted guidance documents. It is considered that the noise assessment has provided more detail than has been generally required for previous noise assessments for NSW wind farms and provides a comprehensive review of the potential noise impacts of the Glen Innes Wind Farm.

It is also noted that compliance monitoring is proposed following implementation of the wind farm to verify the actual impacts and assess any issues of concern to neighbours.

Respondent (C9 & C10) statement's – Of concern is the statement in the Environmental Assessment (Vol 1; Chapter 10 page 3) that Turbine 18 has been moved south to decrease impacts, yet fails to mention that an additional turbine (16B) has been added even nearer to one of the affected residences

Turbine 18 has been moved south to be more distant from the occupied Highfields residence and has now been assessed as being at 1.03 kilometres. Not only does this marginally increase the separation distance it also places the turbine back beyond the lip of the ridge-top above Highfields residence.

In the case of Turbine 16 B it is an additional turbine on a small knoll that is additional to the turbines shown in the 22 turbine layout that was presented for the Preliminary Environmental Assessment. However the respondent statement is wrong in claiming that the Turbine 16B is nearer to an affected residence. It is about 400 metres more distant from Highfields than is the case for Turbine 18.

3.4.10 Different noise environment on ridge and valleys that has not been assessed

Respondent (C9 & C10)statement's – There has been no assessment of the noise environment for the circumstances where it is windy on the ridges, yet the valley floor is still, which is a frequent occurrence nor has there been any assessment of the cumulative effect of clusters of turbines.

The respondent statement is incorrect as described in the following.

Firstly, the background noise criteria have been developed using background monitoring data that was obtained at residence locations in the valleys. The background noise data was correlated with wind speed data for the meteorological masts on the ridge tops and for heights of 80 metres simulating the turbine hub height. In this manner, the amenity criteria are developed in respect of wind speeds for the hub height which is also used as the reference for the turbine sound power levels.

Secondly, the modelling undertaken uses the wind speed at hub height to determine the output sound power level for the reference turbine to derive the predicted noise levels at neighbouring residences taking into account distances and noise propagation characteristics.

Thirdly, the modelling determines the predictive noise levels at receiver locations in respect of the contributions of all turbines to determine the predicted noise level at a specific location.

Respondent (C9 & C10)statement –There is no doubt that at whatever the level of environmental noise, except at high wind speeds, the 'background' noise environment and character of the southern end of the Furracabad Valley will be permanently altered. This will be distressing to the number of close and sensitive residents into the future.

Wind energy developments have taken place world wide with many readily accepted into rural communities. It appears that those with adverse impacts are relatively rare and those outcomes can generally be explained in terms of poor wind farm design, old technology or inappropriate control systems. The respondent statement is considered to represent one extreme of a spectrum of views and does not seem to reflect any systematic noise assessment or review of the material provided in the Environmental Assessment.

3.4.11 Infrasound

Respondent (C9 & C10) statement – Despite the frequency with which infrasound is mentioned in the literature as a negative impact of wind farms there has been no addressing of this issue within the document.

Reviews of the literature have identified that infrasound is not a significant issue for wind farms and hence it has not been dealt with in the Environmental Assessment.

Infrasound/low frequency noise emissions were characteristics of some early wind turbine models. This has been attributed to early designs in which turbine blades are downwind of the main tower. This phenomenon does not occur with upwind turbine technology. Modern designs of wind turbine generators generally have the blades upwind of the tower (the rotor facing the wind). The basic advantage of upwind design is that it avoids the wind shade behind the tower. The turbines being considered for the Glen Innes Wind Farm are of the current (upwind) turbine technology and are not expected to present problems related to the generation of infrasound/low frequency sound energy.

Despite the above, low frequency sounds of wind turbines and vibration effects are sometimes mentioned by respondents to wind farm planning applications as being an acoustic concern. However, these factors have been researched and are not considered to cause adverse effects. Consistent with internationally published results, Mr George Bellhouse (a Wellington, NZ-based acoustic consultant) prepared a literature review on low frequency wind turbine noise ("*Low Frequency Noise And*

Infrasound From Wind Turbine Generators: A Literature Review" Prepared for: Energy Efficiency and Conservation Authority By: George Bellhouse, Wellington NZ. 30th June 2004). The review found that:

- "The evidence available is that the level of emissions of low frequency sound and infrasound from wind turbine generators is so low that it is inaudible.
- There is no reliable evidence to indicate any effects on people when infrasound is present at an inaudible level (below the hearing threshold)."

An informative paper on the subject of low frequency sound and vibration from wind turbines by a world renowned expert (Dr Geoff Leventhall), clearly establishes that low frequency sounds from modern wind turbines are not likely to adversely affect the health or welfare of residents living at typical setback distances (*Leventhall, Dr Geoff. 4th June 2004. Notes on Low Frequency Noise from Wind Turbines with special reference to the Genesis Power Ltd Proposal, near Waiuku NZ. Prepared for Genesis Power/ Hegley Acoustic Consultants*). Dr Leventhall stated in his review that;

"The rational study of low frequency noise, its effects and criteria for control, has been bedevilled by exaggerations, half truths and misrepresentations, much of it fomented by media stories over the last 35 years. The result in the UK, and it is probably similar in other countries, is that an incorrect concept, "low frequency noise is a hazard", has taken root in the national psyche, where it lays dormant waiting for a trigger to arouse it. The current trigger is wind turbines. Previous ones have been gas pipelines and defence establishments. When this is coupled to the failing, which we all have, of generally believing what we want to believe, it is seen that it is not easy to persuade lay people of the truths of low frequency noise which can be summarised as:

- High levels of low frequency noise are required for perception, increasing as the frequency reduces.
- The ear is the most sensitive receptor in the body. If you cannot hear it you cannot feel it.
- Continuous audible low frequency noise can be a nuisance, as can any other noise, but it must be above threshold for this to occur.
- Where problems often arise with predominantly low frequency noise is because the A-weighted assessment methods do not cater for it. This leads to the noises being dismissed as not a nuisance, leaving unhappy complainants in a stressed state."

It is noted that if low frequency noise is raised as an issue after installation it is possible to assess low frequency noise. It is indicated by others that both A-weighted and C-weighted noise levels can be monitored and analysed to identify the presence of low frequency noise impacts. Should there be concern that low frequency noise is impacting neighbours then assessment methods are available.

Regarding the issue of ground vibration caused by wind turbine operation, this has also been researched in detail. Regarding measured levels of ground vibration from wind turbines, the most relevant information to hand derives from measurements in the UK from modern wind turbines using very sensitive equipment in Scotland during 2005 whereby seismic monitoring was conducted in the vicinity of an operational wind farm by Professor Peter Styles of the Keele University (*A detailed study of the propagation and modelling of the effects of low frequency seismic vibration and infrasound from wind turbines: Peter Styles, Richard England, Ian G. Stimpson, Sam Toon, David Bowers, Malcolm Hayes: First International Meeting on Wind Turbine Noise: Perspectives for Control: Berlin 17th – 18th October 2005*).

Levels of ground vibrations detected in the vicinity of the wind farm were very low, below thresholds of detection for humans and animals and well below levels which would cause any structural damage. Vibrations at this level (and in the frequency ranges found) are caused by all kinds of sources such as traffic and background noise. The research confirmed minuscule levels of measured ground vibration are not only confined to wind turbines. To put the level of vibration into context, they are ground vibrations with amplitudes of about one millionth of a millimetre. These findings did not show there was

any possibility of humans sensing the vibration and indicated there was absolutely no risk to human health.

3.4.12 Inappropriate noise standards and lack of robustness of the assessment

Respondent (C6) statement -The submission of Daniel McAlary indicates that the noise assessment is based on "inappropriate noise standards"

The noise assessment has addressed the Director-General's requirements for the assessment of environmental impacts which involved the following elements:

- The Environmental Assessment must include a comprehensive assessment of the predicted noise impacts resulting from the construction and operation of the proposal.
- The assessment must include consideration of noise impacts of the project, with a particular focus on scenarios under which meteorological conditions characteristic of the locality may exacerbate impacts (such as the Van den Berg effect for wind turbines) at sensitive receivers.
- The noise assessment must be undertaken in accordance with:
  - Wind Turbines - The South Australian Environment Protection Authority's Wind Farms - Environmental Noise Guidelines, 2003;
  - Remaining Structures - In accordance with the NSW EPA Industrial Noise Policy, January 2000;
  - Construction noise - undertaken in accordance with Chapter 171 of the Environmental Noise Control Manual (EPA, 2004) for noise impacts associated with the proposal, particularly along the main access routes to the site;

The above aspects have been addressed for the relevant parts of the project including the operation of the wind turbines and for the substation and for construction noise.

The New Zealand Standard NZS 6808 sets noise levels at the greater of 40 dBA or background + 5 dBA at the notional boundary of the noise sensitive location (typically 20 metres from an affected dwelling). The SA EPA Environmental Noise Guidelines for Wind Farms sets the level at 35 dBA. Other noise criteria for overseas countries have been set at higher noise levels

Respondent (C9 & C10) statement – We conclude the noise assessment was designed to meet the basic regulatory noise requirements and is not a comprehensive assessment of the total effects of noise created in the valley

The statement underestimates the degree of detail considered by the assessment and is considered an unreasonable statement by the respondent. The proponent regards the report as being more detailed than many other assessments undertaken for NSW wind farm projects. The Glen Innes Wind Farm noise assessment has focused on the noise of the wind farm project on the ambient noise environment of the areas surrounding the wind farm and uses an appropriate and accepted guideline for that purpose.

Some submissions also draw on papers linking specific noise impacts with health effects including sleep disturbance. Matters relating to health effects are discussed in Section 3.5.

Another submission suggests the noise assessment should have provided separate day and night analysis. The noise criteria are set for any time of day but their development has recognised that the more sensitive times for noise impacts typically occur during evening and night-time hours. Setting of the noise limits for operation of wind turbines takes account of suitable criteria that will protect the noise amenity for night-time hours.

3.4.13 Conclusions in relation to noise assessment and impacts

The respondent submissions included comments by the DECC, Glen Innes Severn Council and neighbours to the wind farm. The proponent has provided responses to the DECC comments in this submissions report. Provided the project is approved, these aspects are expected to be addressed in the project approval conditions.

The issue of noise impact for neighbours is one where there can be some uncertainty on the part of neighbours as to what the impact will mean for them and this submissions report provides clarifications in response to matters raised in the respondent submissions that indicate some confusion as to the assessment process and the associated results.

Overall the noise assessment is regarded as a comprehensive assessment that has addressed the requirements of the South Australian EPA Environmental Noise Guidelines and the Director-General's requirements for the Environmental Assessment.

The instances of predicted exceedance at specific integer wind speeds need to be addressed by the proponent either in determining the turbine equipment selection and the final array design or by incorporating capability to modify the wind farm operation at times when the exceedances may occur. Ultimately the wind farm will be required to comply with the applicable noise amenity criteria and the proponent recognises the significant financial risk it would be exposed to if it implemented a wind farm that was not able to comply with the relevant noise criteria.

3.5 Health Issues

A number of the respondent submissions raised the issue of potential health impacts for residents in areas surrounding wind farms. The submissions draw on a number of publicly available articles indicating evidence of health issues for overseas wind farms that are indicated to have been located too close to residences. The respondents also refer to suggestions made, by some of the authors of the articles referred to, for minimum wind farm setback distances. It is understood that the setbacks that have been applied to many overseas wind farms in the past have been significantly less than is generally applied for Australian wind farms and significantly less than is the case for the Glen Innes Wind Farm.

Some of the respondent submissions have attached extracts from papers on health aspects arising from wind turbines and the proponent's comments on matters raised by the respondent statements and for the relevance of articles referred to by respondents are provided in this section of the submissions report.

The matters dealt with in this submissions report relating to potential health issues are discussed in the following sections as listed below.

- Environmental Assessment's treatment of health issues
- Dr Amanda Harry and UK health issue surveys
- Dr Nina Pierpont and Wind Turbine Syndrome
- Other papers regarding health impacts referenced by respondents
- Proponent's conclusions in respect of health issues

3.5.1 Environmental Assessment treatment of health issues

Respondent (C9) Statement - The authors of the EA have not addressed the many health issues surrounding wind turbines being placed too close to homes which makes the EA deficient. Volume 1; Executive Summary (ES12) Safety Issues. It states that "There are no health issues likely to arise from the project". This is a FALSE STATEMENT. This is the only reference in the

entire 2 volumes of the EA to potential health concerns. Clearly the health issues have not been addressed because the authors did not wish to address them, as there are serious health issues and no alternative argument exists. The EA has ignored the enormous amount of research from a wide variety of sources indicating negative health effects on people who live close to wind turbines, particularly within 2 kilometres.

Respondent (C10) Statement - The dismissive statement in the Executive Summary (ES12), that "There are no health issues likely to arise from the project" completely ignores the enormous amount of material from a wide variety of sources indicating health effects of proximity to wind farms. Some exposition of the perceived problems elsewhere would have at least indicated a thoroughness of investigation.

In preparing the Environmental Assessment, the authors have considered a range of matters that relate to health and safety and these are described in Section 12 of the Environmental Assessment and summarised below together with guidance to other parts of the Environmental Assessment addressing these items.

- Aviation (also addressed through correspondence with CASA and Council, Appendix B2)
- physical safety associated with the turbines themselves (addressed by design standards)
- bushfire risk (to be addressed through the CEMP and OEMP as indicated in Statement of Commitments)
- electrical safety including Electric and Magnetic Fields (EMF) (addressed by design standards)
- road safety (also addressed by Appendix I of the Environmental Assessment and to be the subject of a Traffic Management Plan as indicated in the Statement of Commitments)
- use of plant and equipment on steep slopes on the site (addressed by CEMP and contractors safety plan)
- shadow flicker (also addressed by Appendix D of the Environmental Assessment – no mitigation proposed as shadow flicker has been assessed as not presenting any health or safety risk)
- noise (also addressed by Appendix H of the Environmental Assessment and to be subject to the mitigation measures identified in the Statement of Commitments and post commissioning noise compliance assessment)

Of the above issues covered by the Environmental Assessment and for those relating to health rather than safety matters, the respondents appear to have most concern regarding potential noise impacts and the potential to impact the health of neighbouring residents. Shadow flicker has also been raised as a concern to respondents but their responses have provided less supporting material in respect of the issue of shadow flicker. The proponent also believes that the issue of shadow flicker has been thoroughly addressed and clearly demonstrates that it does not present a risk.

The following section of this submissions report provides the proponent's response to some of the respondent statements and also provides comments on the articles referenced by the respondents.

Respondent (C9) Statement - Dr Amanda Harry, a pioneer in health effects on people near wind turbines recommended "that no wind turbines should be sited closer than 1.5 miles away from the nearest wind turbine" in her paper "Wind Turbine, Noise and Health 2007".

Respondent (C9) Statement - This has been confirmed by Dr Nina Pierpont MD who has further studied and documented these adverse health effects. Her soon to be published book on "Wind Turbine Syndrome" is available in draft form at www.windturbinesyndrome.com and has been favourably peer reviewed by medical experts. We include her Curriculum Vitae under the main topic "Health Issues".

Articles that have been referred to by respondents C9 and C10 include some that have emerged over the last couple of years. The articles attribute a range of health impacts to wind farms being located in close proximity to residences. The articles referred to by the respondents include recent articles by the authors listed below.

- Dr Amanda Harry, Wind Turbines Noise and Health, February 2007 (see Section 3.5.2)
- Dr Nina Pierpont, Wind Turbine Syndrome: A Report on a Natural Experiment (Draft) (see Section 3.5.3)

These publications have been prepared by the respective doctors as reviews of persons that have lived in close proximity to wind farms and who have reported ill effects which they generally believe are related to the wind farms. This has then led to the respective doctors hypothesising about the causes of the indicated illnesses and recommending specific setback distances from residences.

Due to the claims made by the articles in regard to health issues and wind farm siting they warrant review in the context of the Glen Innes Wind Farm proposal and comments on the articles are provided in the following notes.

3.5.2 Dr Amanda Harry and UK health issue surveys

Dr Amanda Harry's report entitled, *Wind Turbines Noise and Health, February 2007* provides her findings of a survey involving about 40 respondents where she asked them to complete questionnaires in respect of their age, property details, specific health aspects and the respondent's view of whether they felt the their 'quality of life' effect on quality of life. The respondents to her survey were from a number of locations in UK, Wales, Cornwall and north of England.

The questionnaires were sent to people already indicated to be suffering from problems which they felt were due to their proximity to wind turbines. All people involved in the survey were contacted either by phone or in writing. Over 80% of the respondents to Dr Harry's surveys are within one kilometre of the turbines and about half of these are at distances of less than 500 metres from the nearest wind turbine

Results of the survey are provided in Dr Harry's February 2007 paper and part of the summary follows. "*There are many people living near wind turbines who are suffering from problems with their health. The noise produced from wind turbines is an extremely complex one and I feel it is complexity of the noise and vibration which causes the disturbance. From my discussions with people suffering from ill health who live near wind farms, it seems that the symptoms can occur up to a mile from a wind farm* (1608 metres). *Until further medical and epidemiological research has been carried out I would suggest that no wind turbines would be sited closer than 1.5 miles away from the nearest wind turbine* (assumed this should read residence). The summary also refers to a UK guidance document for establishing a safe distance between turbines and dwellings, ETSU-R-97 which is indicated to be outdated and inappropriate. The document ETSU-R-97 has not been used in respect of turbine siting for Glen Innes Wind Farm.

The proponent's review of Dr Amanda Harry's 2007 paper indicates that the limited survey method, small sample size, lack of detail of the circumstances of respondents in respect of their health history and the extent of impact by the wind farms could be considered by some reviewers as limitations for drawing reliable conclusions and for confidently using the results for the basis of planning decisions. Her summary indicates the need for further medical and epidemiological research and appears to suggest what is considered a conservative setback distance. The setback proposed by Dr Amanda Harry appears significantly greater than has been applied in Australia based on protecting noise amenity despite the Australian noise guideline represented by SA EPA Environmental Noise Guidelines being more conservative than measures applied in many instances at overseas locations.

3.5.3 Dr Nina Pierpont and Wind Turbine Syndrome

In the case of Dr Nina Pierpont, her work addressed a topic she terms *Wind Turbine Syndrome* and which she suspects is a vestibular system (inner ear/balance) disturbance. Her work followed that of Dr Amanda Harry and was undertaken in the United States. Her study is referred to by her as a "case series" being defined as *a descriptive account of a series of individuals with the same new medical problem*. Ten families were included in her case series. A number of other health specialists also assisted with the documentation of the study.

In terms of reference to control groups she indicates that she set up a '*before-during-after'* study format. She also indicates that a limitation of the study was that it was conducted entirely by clinical interview, over the telephone. She completed her interviews in February 2008 and indicated that when participants were contacted in May 2008 that eight of the ten assessed had moved away from their former homes to alternative locations.

It is noted that Dr Nina Pierpont is preparing a book for publication (first draft complete in May 2008 and publication indicated for early 2009 but not available as at May 2009). The book once available will be offered for sale. The draft book is indicated to have been subject to peer review with changes suggested by the reviewer. Her website indicates several factors delaying its completion and prior to finalisation of the book she has provided extracts from the draft on the web.

A review in the *Acoustic Ecology Institute Special Report: Wind turbine noise impacts January 2009*, indicates that "*it should be clearly noted that only a small proportion of people living near turbines are strongly affected; Pierpont's work focuses on these few…..".* The Acoustic Ecology Institute article does not clarify just how close those being affected are located.

Nina Pierpont states that Wind Turbine Syndrome (WTS) as she defines it is not the same as Vibroacoustic Disease as the proposed mechanisms are different and the noise amplitudes are probably different as well. She distinguishes them as follows:

- **WTS** – Dr Pierpont proposes that WTS is mediated by the vestibular system – by disturbed sensory input to eyes, ears and stretch and pressure receptors in a variety of body locations. They are indicated to feed-back neurologically onto a person's sense of position and motion in space which is in turn connected in multiple ways to brain functions as disparate as spatial memory and anxiety. It is suggested that the amplitude (i.e., power and intensity) of low frequency noise and vibration needed to create these effects may be even lower than the auditory threshold at the same low frequencies. While Dr Pierpont has suggested a link between wind turbines and the health effect referred to as WTS, the linkage based on clinical interviews conducted for ten families entirely over the telephone would appear to be a tenuous basis for establishing setbacks. The linkage does not appear to have been proven.
- **Vibroacoustic disease** is hypothesized to be caused by direct tissue damage to a variety of organs, creating thickening of supporting structure and other pathological changes. It is caused by high amplitude (high power or high intensity) low frequency noise.

It is noted that Dr Nina Pierpont makes assertions as to wind developer motives indicating that "*it is well known that wind developers target impoverished communities for their wind farms*". Such an assertion does not appear consistent with the Australian experience where many wind farm sites are within areas having a range of wealthy rural landowners as appears to be the case for the Glen Innes Wind Farm. The assertion by Dr Nina Pierpont raises a question as to her limited experience of the basis of site selection for wind energy developments and/or the impartiality of her approach to the issue of wind farms and her case for WTS.

In regard to setbacks she refers to dialogue with George Kamperman and Rick James where they "*have convinced her that a single, one size fits all setback distance may not be both protective and fair in all environments with all types of turbines"*. She indicates that it is clear from her study and others that minimum protective distance need to be:

- more than the 1 – 1.5 km at which there were severely affected subjects in the study,
- more than the 1.6 km at which there were affected subjects in Dr Harry's study
- and in mountainous terrain, more than the 2-3.5 km in which there were symptomatic subjects in Professor Robyn Phipp's New Zealand study

In summary, she suggests two kilometres is the baseline, shortest setback from residences (and hospitals, nursing homes, etc) that communities should consider. In mountainous terrain 3.2 km is indicated by her as a better guideline. She indicates that shorter setbacks in the US and elsewhere (305 to 457 metres) are a convenience and financial advantage for wind developers and participating landowners. She suggests they have no basis in research on safety and health and they do not make clinical sense. Nevertheless, there appears to be considerable difference between setbacks being applied for existing wind farms and those proposed by Dr Harry and Dr Pierpont.

The proponent does not have detailed medical knowledge to review the material in the Dr Pierpont and Dr Harry studies but raises the following issues in regard to the studies and the applicability of their findings.

- The surveys on which the doctors have based their conclusions were conducted at distance, either by phone or by exchange of correspondence. The surveys do not appear to represent a rigorous medical investigation that can be used to provide reliable planning guidelines for wind farm projects.
- Many of the indicated impacts relate to effects at distances closer than is being proposed for the Glen Innes Wind Farm. In the case of surveys by Dr Amanda Harry, over 80% of the respondents are indicated to be within one kilometre of the turbines and about half of these are at distances of less than 500 metres from the nearest wind turbine
- The technical details of the wind farms relating to individuals assessed by the studies do not appear to be considered by the studies and the lack of this information limits the ability of the reader to draw reliable conclusions from the studies in relation to setbacks. It is noted that some initial concerns with impacts from some wind farms have been addressed by modification of the wind farm operation
- The circumstances of the persons indicated to be affected are not sufficient for the reader to gain a clear impression of their health history and whether their health impacts can be attributed to the wind farm. Given that health effects may often be due to various sources there does not appear to be a systematic review of alternative sources of impact on the individuals studied. It therefore appears difficult to reliably link the study information to the planning criteria for new wind farms
- The symptoms listed by the studies are not rare in the broader community and are commonly present to various extents within communities that are not in proximity to wind farms. It is not clear what proportion of the broader neighbouring communities has been assessed and it appears that the individuals studied have been targeted as having symptoms that relate to the study potentially indicating a bias in sampling that would diminish the usefulness of the survey results.

There appears to be many instances for existing wind farms where setbacks of turbines from residences are considerably less than those being proposed by the respective authors of the studies. The proponent is aware of a range of residences mainly wind farmer residences at close distance (350 to 1000 metres) to Australian wind farms where no adverse health effects are evident and the respective residents are accepting of the wind farms.

3.5.4 Other papers regarding health impacts referenced by respondents

Professor John Harrison of Queen's University, Canada in his paper '*Disconnect between turbine noise guidelines and health authority recommendations*' notes that "*health authorities recommend 1.5 to 2 kilometres while noise guidelines allow setbacks of 400 to 500 metres*". He further states that "*The resolution lies in the inadequacy of noise guidelines*".

The reference to setbacks of 400 to 500 metres appears to relate to circumstances in Canada. The reference to fixed distance for setback of turbines from residences is not applicable for Australia where background modelling is used to develop amenity criterion and then predictive noise modelling is used to identify whether compliance can be achieved. This provides a more legitimate means for determining appropriate siting of wind turbines than appears to be used in some overseas locations. It results in setback distances for Australian wind farms of perhaps twice the distance that has been applied for some overseas sites.

Kamp and James, have provided a paper "*How To – Guide to criteria for siting wind turbines to prevent health risks from sound*" that incorporates their NOISE-CON 2008 paper – "Simple guidelines for siting wind turbines to prevent health risks". These were both dated July 2008.

They assert that developments in the US of 1.5 to 3MW turbines have:

- Led to numerous complaints
- Raised questions in regard to the current siting guidelines
- Led to research into health issues that supports the basis for health concerns
- Indicated that computer modelling not considered as accurate enough to be used as sole basis for making siting decisions

The Kemp & James papers are focussed on the US situation that allows for higher noise limits and lesser set back distances than is the case for Australian wind farm developments.

In proposing a solution for setting 'safe' guidelines for siting turbines Kamp and James have proposed use of A-weighted and C-weighted sound levels. The C-weighted criteria are to address the impacted resident's complaints of wind turbine low frequency noise.

The Kamp and James proposal is to use the following:

- No exceedance of pre-construction background sound levels by more than 5dBA
- Background sound levels shall be the LA90 sound descriptor during quietest time of evening or night. LA90 results are valid when LA10 results are no more than 10 dBA above LA90 for the same time period
- Based on the above an emission limit of LA90 + 5 dBA
- General requirement, not to exceed 35 dBA within 30 metres of any occupied structure.
- A 5dB penalty is applied for tones as defined in IEC 61400-11
- C weighted noise level not to exceed LA90 + 20 dBA
- Maximum not to exceed 50 dB(C) (where more than one kilometre from State Highways) or 55 dB(C) (where within one kilometre of State Highways)

While the proposal purports to address the impact of increasing wind speeds as they affect background levels, the general clause which caps the noise level at 35 dBA will marginally limit some of the turbine operation at higher wind speeds without necessarily providing significant amenity benefit. Current NSW practice is to set a minimum level for noise amenity criteria of 35dBA and it does not appear reasonable to apply a more stringent noise limit to wind farms than would apply for other noise sources. The consideration of C weighted noise levels may warrant further review in circumstances where complaints are received however existing papers appear to indicate that low frequency impacts are not evident for most wind farms.

3.5.5 Proponent's conclusions in respect of health issues

The proponent acknowledges the respondent concerns and the articles referenced by the various respondents in relation to potential health effects from wind farm developments. The proponent also acknowledges that there appear to be instances of some overseas wind farms having been sited at distances that may be too close to neighbouring residences and/or that some past wind turbine designs have been associated with problematic noise conditions. However, it also understood that the wind industry has responded to previous instances of noise and disturbance and has developed improved designs for turbine blades and control systems and is giving consideration to and complying with guidelines that address predicted noise levels relative to noise amenity criteria. Regulators are also requiring wind farm projects to comply with appropriate amenity protection guidelines.

In the case of the Glen Innes Wind Farm, the project must comply with noise criteria established in accordance with the South Australian EPA Environmental Noise Guidelines – Wind Farms. Those guidelines have been developed, by the South Australian EPA in consultation with other government agencies, developers and noise specialists, with the core objective of balancing the advantage of developing wind energy projects with protecting the amenity of the surrounding community from adverse noise impacts.

The South Australian EPA guidelines are considered more conservative than criteria established for other regimes. For instance New Zealand and Victoria use the New Zealand Standard NZS 6808 which sets a higher predicted base level than is the case for the South Australian EPA Noise Guidelines. It is the proponent's view that it would be inappropriate to apply setbacks that are greater than those indicated by use of the more conservative noise guidelines. Despite the application of the guidelines it is still possible that the wind farm will at times be audible at neighbouring residences. However, occasional audibility does not mean that the impact will lead to disturbance and health impacts.

In the consideration of noise impacts and disturbance a characteristic referred to as 'tonality' is also taken into account. The issue of 'tonality', i.e. noise with perceptible and definite pitch or tone, is a characteristic that can increase the adverse impact of a given noise source and it can be determined by breaking the noise signature down into discrete frequency bands. If tonality is a characteristic of the wind turbine noise, 5 dBA is added to the predicted or measured noise level from the wind farm. While tones may be identifiable by monitoring at the respective turbine sites these are not likely to be present at the distances between the Glen Innes Wind Farm turbine sites and surrounding residences.

The information reviewed has not demonstrated that the Glen Innes Wind Farm would present a health impact for the local community. The proposed design can be operated so as to comply with relevant noise amenity criteria and accordingly it is not expected that any health effects will be experienced by the wind farm development. It is also possible that the final array will have a lower impact than indicated in the Environmental Assessment.

3.6 Two kilometre set back and removal of up to 10 turbines

A number of the respondent submissions from the local community in the Furracabad Valley are seeking amendment to the project to have a two kilometre setback from neighbouring residences and for up to 10 turbines to be removed from the proposed array with or without relocation of removed turbine sites to locations more distant from the Furracabad Valley residences. This is regarded by a number of the respondents as being a satisfactory modification to the project which would make it acceptable to them. Some submissions have indicated that a 3 kilometre setback is preferred. A single submission was also obtained from a property on Waterloo Range requesting consideration of the 2 kilometre setback.

3.6.1 Glen Innes Severn Council DCP – Wind Energy

The respondent submissions refer to the Glen Innes Severn Council's recently implemented Development Control Plan (DCP) of May 2008 that is an attachment to the Council's submission. The Development Control Plan for Wind Power Generation has been apparently developed by Council in response to the requests of the Glen Innes Landscape Guardians requesting a specific setback from residences. It also appears that a similar DCP document prepared by the Upper Lachlan Council, of the Southern Tablelands of NSW, may have been referenced by Glen Innes Severn Council in the preparation of the DCP for the Glen Innes Severn Shire.

The respondent submissions have referred to visual, noise and shadow flicker issues and to articles by health specialists that address a range of health issues indicated on the basis of mainly telephone surveys to be related to the proximity of wind farm developments. The proponent's comments on matters referred to by respondents in respect of visual, shadow flicker, noise and health are provided in Sections 3.3 to 3.5.

The application of 2 kilometres as a required setback appears somewhat arbitrary and needs to be considered in terms of the specific wind farm design and setting as well as the specialist assessments provided in the Environmental Assessment. Experience gained at other locations can also be used in relation to key issues and the need for the application of a specific setback. On balance, there are articles that support setbacks less than 2 kilometres and others that extend the distance required for setbacks with the extreme end of 8 miles that has been proposed for New Mexico.

3.6.2 Neighbours comments on setback and removal of turbines

Respondent (C4) statement – We are concerned about the visual impact of the turbines that will affect the whole valley but are even more concerned about the effect they will have on our neighbours who are within a 2 kilometre radius of the turbines. We were never, at any stage, consulted about the proposed wind farm, did not receive any correspondence or a visit from the proponents or their consultants.

We support the Council's DCP with a minimum 2 kilometre setback as this regulation would minimise the visual, noise and health effects of turbines close to homes.

The Proponent acknowledges the support that some members of the Glen Innes community are providing for the neighbouring residences. However, the wind farm design needs to be considered in respect of the technical and specialist assessments provided in the Environmental Assessment rather than subject to an arbitrary setback. It is noted that the respondent is located greater than 4 kilometres from the proposed wind farm.

Respondent (C1, C9 & C10) statement - We seek the removal or relocation of the turbines of the central eastern group numbers 10, 20B, 21B and 22B and southern group numbers 18, 19, 15, 16B, 16C and 17. We believe that these can be removed or relocated without loss of integrity of the wind farm.

It is not clear how the respondent has reached the view that 10 turbines can be removed without '*loss of integrity'* of the wind farm. It is the proponent's view based on systematic consideration of the relevant technical, property and commercial aspects that the removal of 10 turbines could significantly affect the viability of the proposed wind farm. The proponent is best placed to determine the potential design that will provide a viable project and is still reviewing options for the project should it obtain the Minister's approval to proceed with the wind farm implementation. Any variations to the proposal arising from the proponent's ongoing review would result in a lesser impact than that considered in the Environmental Assessment. Any proposal to increase the extent of the development beyond that assessed would require consideration of the need to seek a modification of a Project Approval.

Respondent (C9) statement - Vol 2; Appendix C; 10 – Mitigating Options – Para 3. confirms that the developer is aware of the problems associated with the south-eastern turbines. They state that to remove them would make the wind farm unviable. Unviability should not, and cannot be a reason. Individual landowners rights MUST take precedence. In any event, how can this be, when they originally started out with 22 turbines and the project was completely viable then.

The 22 wind turbine array had been developed at a time when the project was contemplating a grid connection at 66,000 volts. The progression of TransGrid's strengthening of its northern NSW Grid infrastructure with the upgrading of the Glen Innes Inverell line from 66,000 volts to 132,000 volts enables more power to be exported from the site but also has the consequence of requiring a greater expenditure on the 33,000 volt/132,000 volt substation. This change increases the overhead costs for the development and changed the viability of the 22 turbine array. Even considering the 22 turbine array it is noted that it also involved turbines on the ridges where the respondents are seeking their omission. Additional turbine sites incorporated in the 27 turbine array are on the western side of the site where they appear to be of less concern for the Furracabad community.

Respondent (C9) statement - There must be an option to move these turbines to other locations within the development, away from the close proximity to people's homes. We believe that prior to the Environmental Assessment going on public exhibition, this option was not considered. We believe this because the Developers are now in fact reviewing their options in this regard and we believe that it is indeed possible. Such goodwill and compromise would see a very successful development proceed, without all the angst currently being experienced.

A number of options for relocation of turbines were considered by the proponent prior to completion of the Environmental Assessment. Options are still being discussed with potential equipment suppliers and the final arrangement is unlikely to be determined prior to the determination of the Project Application and until further negotiations have been completed with potential suppliers and contractors. This situation is not unusual for wind farm developments where contracts are only finalised once all the critical arrangements are in place.

Respondent (C9) statement - Vol 2; Appendix C; 11; para 4. The last sentence of this paragraph states that* "… the wind farm… has setbacks from residences that are greater than has been used for many other international wind farm projects."** ***It would appear that the developers are not keeping up with trends overseas. There is a strong push to ensure that neighbouring residents are not too close to wind turbines. There is enormous data on numerous websites railing against turbines in close proximity to homes.

The proponent acknowledges that there is a large amount of material on websites objecting to wind farms or indicating adverse effects of wind farms. However, many examples of exaggerated claims are evident and the volume of information does not validate the reliability of the views presented on websites. The proponent also understands that a significant number of objections have arisen from earlier developments that have only allowed for 300 to 500 metre setbacks and these distances are not being proposed for responsible Australian developments.

Respondent (C9) statement - In fact, the builders of wind turbines also recommend a 2 kilometre setback of turbines from buildings, especially homes. "RetexoGruppe - RISP GmbH" is a major builder of Wind Turbines for Europe. They also assist developers in the planning of their wind farms from assisting with the site location; measurement of the wind intensity to ensure it is satisfactory; the amount of area required to construct a wind farm; Grid connection and liaising with local Electricity suppliers.

TetexoGruppe – RISP unequivocally state that "Buildings, particularly housing, should not be nearer than 2 km to the wind farm". (See Attachment 7. Site Location; Description of Location). We were unable to merge this into our document but will include a hard copy in our posted hard copy submission.

The proponent is aware of the reference quoted by the respondent but indicates that it is a brief and potentially generalised statement that does not appear to provide supporting details for their statement.

Respondent (C9) Statement - Today in overseas locations, the new and successful wind farms are located in remoter areas. They are not near private homes therefore they are not fighting opposition to their developments because they are locating turbines too close to homes. Overseas developers now realize that sensitivity to people and people's lives and wellbeing is critical to keep the public supportive. There does not need to be a "sacrificial lamb" if developments are thought out properly.

The proponent acknowledges that setbacks are an important consideration for wind farm projects and expects that setbacks are established in relation to systematic review of the relevant criteria. The Statement by the respondent as to being the 'sacrificial lamb' is an emotive representation of the situation and does not contribute to establishing a meaningful setback. The Environmental Assessment provides qualitative and quantitative information to guide the decision making process and the Department is expected to make its own assessment of the relevant factors including reference to the Environmental Assessment, the respondent submissions, its site visits and other relevant sources of information available to the Department.

The reference to overseas developers moving to remoter areas may also be attributed to some countries having already developed the more accessible areas closer to load centres and network infrastructure. Assuming that the global growth of wind farm developments is sustained at about 30% per year then it is reasonable to assume that many areas not previously subject to wind farm developments will be considered for new developments where wind energy resources are suitable.

Denmark is indicated to obtain 20% of its electricity supply from wind farms and to have about 3,180 MW of installed capacity, some three times the installed capacity for Australia. Denmark has achieved this despite having a population of 5.3 million occupying a total land area of only 43,095 km^2 compared to Australia's considerably larger land area of 7.68 million km^2.

In the case of Germany with a population of over 80 million for a land area of only 356,974 km^2, it has an installed capacity of 23,900 MW. Australia has just 5% of the installed capacity of wind energy that Germany has even though Germany only has about 5% of the land area of Australia. Clearly there is a much greater density of wind farm installation in Germany.

Spain has a land area of 504,782 km^2, a population of about 40 million and installed capacity of 16,754 MW.

The above examples of European wind farm developments indicate that there is a high integration of wind farms in these countries and that those countries have taken a much more supportive position than is being indicated in the respondent statement. It appears obvious based on these figures that further European developments may need to seek more remote areas and in some cases further wind farm developments may be constrained in some parts of Europe by limited access to future sites suitable for wind farm development.

The leading country for wind farm installation is the USA with some 25,170 MW installed on a land area of some 9.8 million km^2 and a population of about 270 million.

In addition to the above considerations the respondent statement that remoter areas should be chosen does not always offer a practical solution due to factors such as lesser wind resource, lack of grid and access infrastructure and greater distance to electricity load centres.

Respondent (C9) statement – In conclusion, there is only one real option to mitigate the visual impact of the proposed wind farm at the southern end of the Furracabad Valley – removal

and/or relocation to other landowner sites of the 10 turbines in dispute, namely turbines 10, 15, 16B, 16C, 17, 18, 19, 20B, 21B and 22B.

As indicated above the proponent regards the removal of 10 turbines as a significant impact on the viability of the wind farm project. Despite this situation alternative arrangements have been considered but as yet no suitable alternative has been identified and the proponent has sought approval for the arrangement described in the Environmental Assessment as the maximum development to be considered for the site.

Respondent C10 statement - There is however no doubt that residences within 2km of the south eastern extensions of the proposed wind farm into the Furracabad Valley will suffer major impacts which will be aggravated by the effects of shadow flicker and blade glint. This is why residents here have rallied in support of a 2km setback and obtained legal opinion regarding our options and this is also why the Glen Severn Council has produced a DCP with minimum 2km setbacks. Adherence to this setback would protect residents' rights and health as well as allowing the wind farm to proceed.

The proponent does not agree that Furracabad Valley residences within 2 kilometres of the south-eastern turbines of the proposed wind farm (namely Highfields, Mayvona and Cherry tree (Eungai)) will suffer major impacts aggravated by effects of shadow flicker and glint. The issue of visual impacts, shadow flicker and blade glint have been dealt with in detail in section 3.3.

Respondent C14 statement – The Environmental Assessment has stated that "it is possible that not all of the 27 sites assessed will be developed." Chapter 6-12, Volume I. This would certainly be a step in the right direction in order to reach a compromise - by removing any turbines within a 2 km radius.

As indicated previously, the adoption of the respondent's suggested 2 kilometre setback could have a significant impact on the project viability and may rule out the project proceeding at all. As such it seems more appropriate to use specific criteria for determining the acceptability of the wind farm as opposed to an ad hoc setback distance.

Respondent C14 statement – The proponents say that "Turbine 18 has been shifted to the south of its original location to increase the setback from the Highfields residence" (Chapter 6-11, Volume I) what it failed to say was that turbine 16B was inserted close to our residence!

The respondent is correct that Turbine 18 was relocated further from the Highfields residence and is correct in saying that two turbines (T16B and 16C) are now proposed for the knoll on which Turbine 16 of the 22 turbine array was originally proposed. Turbine 16B the closer of the two is about 1.4 kilometres from the Highfields residence and is expected to be screened to some extent by existing large mature trees to the west of the residence.

3.6.3 Current Australian wind farms and setback to residences

There is no readily available documented dataset of setbacks that have been applied for existing installed Australian wind farms. Nevertheless observations can be made for a range of known wind farm sites that provide insights into setback distances for the respective sites.

To date set back distances of less than two kilometres have been applied for a range of wind farm sites. Even though having residences located at less than two kilometres distance many do not have significant landowner concerns. Nevertheless some wind farms have encountered an elevated level of concern. Wind farms such as the Toora Wind Farm in southeast Victoria have received complaints in respect of noise impacts. The Toora site is indicated to have residences at significantly less than one kilometre setback. At other locations and in the case of wind farmer residences, the proponent is aware of examples of occupied residences being within 400 metres of megawatt scale turbines

including the Vestas V90 3MW turbines. The separation distance is significantly less than is proposed for the Glen Innes Wind Farm.

South Australia
South Australia has to date been leading the Australian states in the development of wind energy projects and in 2008 had about 400 MW of wind farm capacity installed. These projects take advantage of the significant wind energy resources along the South Australian coastline. Summary details for the 240 MW Lake Bonney Wind Farm are provided below.

Lake Bonney (V90-3MW) and Canunda (V80-2MW) Wind Farms
The Lake Bonney Wind Farm has been constructed in several stages and comprises Stage 1 of 46 Vestas 1.75MW turbines and Stage 2 of 53 Vestas V90 3MW turbines. The adjacent Canunda Wind Farm comprises 23 Vestas V80 2MW wind turbines that occur on the Woakine Range adjacent turbines of the Lake Bonney Wind Farm. Together, the current installed capacity for the Lake Bonney and Canunda Wind Farms is 286 MW and comprises 145 turbines.

There are a number of occupied residences at less than 500 metres from wind turbines of the Canunda and Lake Bonney Wind Farms. Examples are Bonneyside, Bastian, Lake Park and Poonada. There are other residences between 0.5 and 2 kilometres from the Vestas V90 3MW turbines, including the Sugarloaf residence at 1.25 kilometres.

Review of noise impacts of the Lake Bonney Stage 2 Wind Farm has verified compliance of the wind farm with the noise amenity criteria developed according to the South Australian EPA Environmental Noise Guidelines.

A third stage of the Lake Bonney Wind Farm was approved in December 2008 and will add another 13 Vestas V90 3MW turbines. The Stage three development spans the Grant District and Wattle Range Council areas and has been approved by these Councils with the benefit of the knowledge of the existing wind farm impacts.

Western Australia
Western Australia has followed South Australia's lead in wind energy development and in 2008 had about 200 MW of installed wind energy capacity with significant further growth potential.

Alinta Wind Farm (Western Australia)
Alinta Wind Farm comprises 54 wind turbines (Total capacity of 89.1MW from 54 by 1.65 MW turbines) that are set on top of a plateau area above the coastal plain to the east and south of Geraldton. The wind farm is partly visible in the distance from Geraldton Airport some 29 kilometres to the north and also from the coastal plain including the village of Walkaway 20 km to the west of the wind farm. The wind farm appears to have been well accepted by the rural and Geraldton communities and on 23rd December 2008, the Greenough-City of Geraldton Council approved the proposed Walkaway II Wind Farm that will add a further 400 MW wind farm with the order of 195 wind turbines located adjacent to the Alinta Wind Farm.

Victorian Wind Farms
Victoria is at an early stage of wind farm development with several wind farms constructed and many more planned including a range of large wind farm projects. The development of Victorian Wind Farm projects has been promoted by the Victorian State Government's supportive Renewable Energy Policy and the Victorian Renewable Energy Target Scheme that has maintained the impetus for wind energy developments as the Federal Mandated Renewable Energy Target is approaching its 2010 target level.

Victorian wind farm developments which are now operating have included Toora, Codrington, Yambuk, Challicum Hills, initial stage of Portland and Wonthaggi. The operating power of the existing wind farms is about 192 MW. However, there is about 4,150 MW of wind power at various stages within the planning system of Victoria or under construction.

It is understood that a setback of about one kilometre is generally applied for neighbouring residences in Victoria with lesser distances acceptable for wind farmer residences. It is understood that Victoria has applied the NZS6808 for noise assessment and setting of noise amenity criteria.

Toora Wind Farm (Victoria)
The Toora Wind Farm is understood to have been associated with some conflict in the early planning stage and post implementation. During the planning stage it was subject to appeal and review by the Victorian Civil and Administrative Tribunal (VCAT) and after some extended delay, approval was subsequently obtained. The wind farm has attracted significant media attention and is in a locality that seems to have shown a degree of resistance to wind farm developments.

It is understood that setbacks for Toora Wind Farm were of the order 500 metres and that the low setback has meant that more complaints have arisen than would otherwise have been the case. To some extent this project may have adversely impacted the image of wind farm projects in the Gippsland Region and subsequent proposals in the Gippsland area have faced greater resistance than for other parts of Victoria. It is notable that few wind farm projects have proceeded in the Gippsland area.

Portland Wind Farm (Victoria)
This wind farm is being developed in stages and has experienced a lengthy period for the planning and approvals process. Pacific Hydro had proposed wind farm developments on headlands and coastline areas of Western Victoria and experienced strong objections from the local community that complained that landscape, avifauna, and noise impacts were unacceptable. After lengthy planning reviews, the project has now progressed to the staged construction of this large wind farm development.

Challicum Hills (Victoria)
The Challicum Hills Wind Farm comprises 35 NEG Micon 1.5 MW turbines. It is understood that the planning process there was no significant opposition and significant community support. The closest residence to the wind farm is about 400 metres. There do not appear to have been any noise issues associated with the site.

NSW Wind Farms
NSW has to date had only a small amount of installed wind energy capacity at less than 20 MW. However a number of significant wind farms have obtained approval and about 170MW is expected to be constructed and commissioned in 2009, involving the Capital and Cullerin Wind Farms in the Southern Tablelands of NSW.

Crookwell Wind Farm (NSW)
The Crookwell Wind Farm that was developed in 1998 comprises eight Vestas V44 600kW turbines. A number of neighbours opposed the development application while a significant number of positive submissions were received from the broader community. The wind farm has now operated for about ten years and appears to be well accepted by the community. The owner of the Wharekarori property on which the wind farm was located, the late Mrs Seaman, lived in her residence at a distance of 600 metres from the nearest turbine. In addition her daughter subsequently built an additional residence on the ridgeline close to the turbines at a distance of about 600 metres or less.

Blayney – The Blayney Wind Farm comprises 15 Vestas V47 660kW wind turbines. The project was subject to initial opposition by several neighbours at the development application stage but since installation appears to have been accepted by the local community. Blayney Shire Council's, Director of Planning and Environment, lives at a distance of about 900 metres from the wind farm. In discussions with him regarding any impacts that occur at that location, he has indicated that he has no problems with the wind farm and indicated that he can occasionally hear the turbines under certain conditions which favour the transmission of noise to his residence. He also indicated that no noise is heard once inside the residence.

Taralga Wind Farm – Approval was initially given by the NSW Minister for Planning to a reduced project. The decision was appealed by neighbours to the wind farm. The subsequent Land and Environment Court decision resulted in vindication of the approval but also allowed inclusion of additional wind turbines that had been excluded from the previous approval. However, the Taralga Wind Farm has not been constructed and post-implementation assessment of impacts is not available. The Taralga project has been subject to extensive legal review with submissions by proponent and objectors and advice from government agencies.

Capital Wind Farm – The Capital Wind Farm about 40 kilometres north east of Canberra and adjacent Lake George involves 67 Suzlon S88 2.1 MW wind turbines. The wind farm is currently under construction and is expected to be operational in the latter half of 2009. As such detail on the operational impacts is not available but performance reviews are proposed.

Cullerin Wind Farm – The Cullerin Wind Farm about 12 kilometres east of Gunning NSW is under construction and will comprise 15 by 2MW REpower turbines. It may be operational by mid 2009.

3.6.4 Overseas examples of setbacks applied for wind farms

The respondents refer to overseas examples of defined setbacks such as for the Riverside County in California that restricts placement of turbines within 2 miles (3218 metres) of residential development unless the applicant supplies documentation that the machine(s) will not produce low frequency impulsive noise

In the example of Riverside County in California the draft documentation for wind energy resource development policies include the following:

- LU 15.9 Restrict the placement of wind turbines within 2 miles of residential development unless the applicant supplies documentation that the machine(s) will not produce low frequency impulsive noise. (AI 3)
- LU 15.10 Require wind turbines to operate at less than 65 dBA and at less than 60 dBA when installed adjacent to noise-sensitive land uses.

It can be seen from these conditions that the 2 mile setback applies only where documentation is not provided to demonstrate "*that the machine(s) will not produce low frequency impulsive noise*". Also the noise levels permitted for turbine operation in Riverside County are greater than is being applied for NSW wind farm projects.

US and Canada wind farm setbacks. Historically setback distances of less than 500 metres have been applied in the US and Canada but at these distances concerns have been indicated to be more common and it is expected that the setback distances may be increased over time.

A news article from United States indicates that many jurisdictions in the U.S. require only 1,000 foot (305 metres) to 1,500 foot (457 metres) setbacks (although Riverside County, California, mandates two miles (where documentation in respect of low frequency sound cannot be produced). Kittitas County is indicated to have recommended half a mile (804 metres) while other sources say that's not enough to avert possible health impacts.

3.6.5 Conclusions in relation to setback distances

The local community particularly those from the Furracabad Valley have emphasised their support for a two kilometre setback from neighbouring residences as indicated by signage evident in the local area (see photographs below) and from comments within respondent submissions. The Glen Innes Severn Council has also responded to representations by neighbours and introduced a Development Control Plan (DCP) in respect of wind farms.

	
Signs at entry to Santa Rosa (Toovey residence)	Signs at entry to Highfields (Evans residence)

However, the two kilometres setback that is being sought by some stakeholders at the Glen Innes locality is greater than has been applied at many other locations and if applied to the Glen Innes Wind Farm may mean that the wind farm development is not feasible. The case for applying a two kilometre setback does not appear to have been robustly supported and the Environmental Assessment shows that the Glen Innes Wind Farm is able to comply with relevant noise amenity criteria.

The setback distance of two kilometres has also been linked to a request by neighbours for ten turbines from the southern part of the wind farm (includes six adjacent Furracabad Valley) to be removed from the proposal. The net result of taking out the ten turbines could mean that the wind farm is not viable and that it does not proceed at all which is not an outcome supported by the proponent The proponent believes that the existing array can be operated to comply with the relevant noise amenity criterion and the visual impact is not such as would require the project to be rejected or modified to reduce the visual impact. In addition, shadow flicker has been assessed and does not constitute a significant issue for any of the neighbouring residences. The analysis of articles based on health issues indicates that in some cases in the past unacceptable impacts have occurred for a relatively small number of wind farms. However, the information available does not appear to provide hard evidence for supporting a two kilometre setback and there are many instances of wind farm installations with setbacks from residences of much less than two kilometres and many with less than one kilometre setback.

The minimum setback distance indicated in the Environmental Assessment for an occupied residence was indicated to be 0.96 kilometres for Highfields residence. The GPS coordinates obtained for the Highfields residence at the same time as photographs were taken for the recently prepared photomontages indicate that the residence is actually at about 1.03 kilometres and not 0.96 kilometres as has previously been indicated.

3.7 Traffic and transport issues

Submissions have been received in respect of the access to the site from the Gwydir Highway and design and safety considerations and in respect of the potential increased use of local roads with consequences in terms of disturbance, road damage and road safety. These matters are discussed in the following sections.

3.7.1 Roads and Traffic Authority (RTA) response

The Roads and Traffic Authority (RTA) made a submission in respect of access to and from the site via the Gwydir Highway. The RTA requires that an assessment is undertaken to ensure the efficiency and safety of the Gwydir Highway is maintained, noting that the proposed access is within a 100 km/hour zone.

The RTA submission recommended that:

- a single site entry be used for construction and long term maintenance
- all access for construction and long term maintenance should be via the Gwydir Highway and Wattle Vale Stock Route
- the access point should be constructed in accordance with the AUSTROADS Rural Access standards which were attached to the RTA submission
- the design should be for the largest vehicle likely to use the entrance
- A Traffic Management Plan (TMP) that includes Traffic Control Plans needs to be prepared and approved by the relevant authorities to safely manage construction and maintenance activities
- Any works on the Gwydir Highway could require a Works Authorisation Deed (WAD) with the RTA
- Where an entrance gate is setback from the road there should be sufficient standing room for the vehicle at the gate for it to be clear of the highway. Alternatively, a substantive stock grid could be used in place of the gate

The proponent acknowledges the RTA recommendations and agrees to adopt these measures to ensure that the project is implemented safely without adversely impacting the function of the Gwydir Highway as it crosses Waterloo Range. The proponent has amended the project Statement of Commitments to address these matters.

The proponent will appoint a project contractor that will be required to develop a final design for access works to gain entry to the site. It will be a requirement of the contract that the contractor gains approval of the RTA for works adjacent the Gwydir Highway and within the road reserve. Additionally, approval of relevant stakeholders for the adjacent land, namely the Rural Lands Protection Board (RLPB) and Glen Innes Severn Council (GISC) will be required for any modifications to that land.

The approvals of RTA, RLPB and GISC would need to be obtained prior to construction proceeding and the access point implemented at an early stage of site preparatory works.

The contractor will also be required to prepare a Traffic Management Plan based on their proposed vehicle movements. While the broad detail of the types of vehicular movements have been shown in the Environmental Assessment the contractor will be able to provide more specific detail for the Traffic Control Plans which will be developed by the contractor's haulage sub-contractor and will need to be approved by RTA, Police and possibly Council.

The contractor will be required to implement the works in accordance with the Project Approval and obtain all required statutory approvals.

The proponent's revised Statement of Commitments as attached has been updated to address the matters raised by the RTA and local resident responses.

3.7.2 Use of local roads by construction vehicles

In addition to the RTA submission, several neighbours from the Furracabad Valley included in their submissions a number of concerns relating to use of local roads, including:

- increased use of the local roads by construction vehicles
- inadequacy of local roads for use by wind farm construction vehicles
- increased road safety risk including for young children
- additional damage to local roads and need to more frequently maintain these local roads

The proponent's Environmental Assessment also identified a number of these matters as making these routes less suitable for accessing the site. In addition, the existence of a better access route via the northern entrance from the Gwydir Highway and along the former Gwydir Highway route within the

Wattle Vale Travelling Stock Route has led the proponent to adopt the northern route as the preferred route.

While the local roads within the Furracabad Valley have been assessed as unsuitable for the purpose of heavy vehicle movements it was considered convenient to maintain the option to have light vehicles accessing the southern part of the site via Furracabad Road, Cherry Tree Road and Hillside Road.

While the option for light vehicles to use local roads was retained in the Environmental Assessment following concerns raised by the respondents and the proponent's own requirements for effective management of the site and its security it is now proposed that the access to the site for construction staff will be limited to the northern entrance. The only exception would be in the event of the need to evacuate the site in response to a bushfire or where emergency vehicles, such as ambulances or Rural Fire Service vehicles, need rapid access to the southern part of the site.

The above variation to the project addresses respondent concerns relating to additional vehicle use of the local roads in the Furracabad Valley during the wind farm construction.

3.7.3 Proponent conclusion in relation to traffic and transport issues

The amended Statement of Commitments addresses the matters raised by the Roads and Traffic Authority and requires consultation during the pre-construction phase to confirm site access arrangements and for transport by restricted Access Vehicles to the site.

Additionally the proponent's amended Statement of Commitments (Appendix B of this submissions report) includes the statement that no construction vehicles will access the site via the Furracabad Valley local roads and a single point of entry and exit is proposed that uses the former Gwydir Highway route on top of Waterloo Range.

The above provisions address areas of concern raised by respondents in relation to traffic and transport issues associated with the Glen Innes Wind Farm development. Based on the proposed management set out in the Environmental Assessment and with the addition of the above matters involving further consultation as part of project implementation it is considered that there is no significant traffic or transport issue that would limit the project proceeding

3.8 Biodiversity issues

The Environmental Assessment provides specialist reports on the flora and fauna issues relevant to the wind farm development. Based on the assessments undertaken, measures have been identified to mitigate the potential impacts of the project. It is proposed that the Construction Environmental Management Plan will incorporate a Flora and Fauna Sub-Plan incorporating the controls listed in the Proponent's amended Statement of Commitments (Appendix B of this submissions report) and relevant Project Approval conditions. The Sub-Plan will be developed in consultation with the Department of Environment and Climate Change and subject to the Department of Planning's review and approval.

The Department of Environment and Climate Change NSW (DECC) has been involved in the planning process for the Glen Innes Wind Farm since the Planning Focus Meeting in January 2007. Following that meeting DECC provided comments on the assessment requirements to be considered in forming the Director-General's requirements that were issued in May 2007. The draft Environmental Assessment that was lodged with the Department of Planning in March 2008 was subsequently referred to DECC by the Department of Planning as part of its adequacy review. The DECC comments made to the Department of Planning were later forwarded to the proponent and considered by the proponent and relevant specialists. As a result of the review, the Environmental Assessment was subsequently amended before being resubmitted and accepted by the Department of Planning as suitable for public exhibition.

In parallel with the public exhibition, the DECC was also provided with a copy of the final Environmental Assessment and further comments from the DECC were sought by the Department of Planning. On 22nd December 2008, the DECC responded to the Department of Planning in respect of its review of the publicly exhibited Environmental Assessment. DECC's response in relation to biodiversity issues is described in the following sections together with the proponent's response to the various matters.

While other members of the community have commented on biodiversity matters the comments are of a more general nature as they have not had access to the wind farm site and do not have the same specialist capability as the DECC. However, it is also noted that the DECC has not undertaken a detailed site inspection and is reliant on specialist assessments and its local and specialist knowledge for interpretation of these reports.

In addition to the DECC comments relating to biodiversity issues, the Department of Planning in its letter of 6th April 2009 has sought additional information which relates to comments made by the DECC. This submissions report addresses the matters raised by the DECC, the Department of Planning and the Nature Conservation Council.

3.8.1 Comments by the Department of Environment and Climate Change

The DECC response of 22nd December 2009 noted that overall, the issues identified in the DECC letter dated 2 May 2008 have not been addressed. The DECC made specific comment and recommendations is respect of the matters described in Sections 3.8.2, 3.8.3 and 3.8.4 of this submissions report.

3.8.2 DECC comments on threatened species assessment (Issue 12)

The following DECC comments are referenced against the requirements of the Part 3A Threatened Species Guidelines. The DECC stated that no reference was made to a search of the NSW Threatened Species Website and the Assessment of Significance still contains general comments only, rather than specifically considering the species known and likely to occur within the area.

Respondent (A2) statement - The report identifies EECs and threatened fauna species recorded in the study area (ie based on field survey and records from the Atlas of NSW Wildlife). However, the flora and fauna assessment does not appear to have included potentially occurring species. The species recorded in the area (Glen Innes Severn LGA) have been included, but other recorded and potentially occurring species within the sub-catchment have not. The DECC made the following recommendation:

DECC Recommendation: The threatened species assessment should include a search of the NSW Threatened Species Website to obtain a list of species recorded and predicted to occur in the Glen Innes – Guyra Basalts CMA sub-region. The likelihood of these species, populations and Page 4 ecological communities occurring in the vicinity of the proposal should be analysed, and potential impacts assessed for each.

To respond to the DECC comments and the DECC recommendation, KMA has provided additional information in relation to threatened species identified in the NSW Threatened Species Website of the Glen Innes – Guyra Basalts sub-region that had not been addressed by their 2007 assessment report. The KMA additional information is provided as Appendix F of this submissions report and findings are summarised below.

NSW Wildlife Atlas
KMA's approach for the 2007 threatened species assessment was to undertake a search of the NSW Wildlife Atlas, which is a database of species records maintained by DECC; the Atlas is accessible

online. This search revealed that only three threatened plant species and two threatened fauna species have been recorded within 10 km of the Glen Innes Wind Farm project area and that only a few more species had been recorded within 20 km of the project area. The database search was widened to include the entire Glen Innes Severn local government area (LGA), an approach felt to be more appropriate because of the nature of the broad landscape in which the project area is located.

The KMA report 2007 therefore considered the potential for the 23 threatened plant species and 46 threatened fauna species that the NSW Wildlife Atlas indicated have been recorded in the Glen Innes Severn LGA.

NSW Threatened Species Website
The NSW Threatened Species Website lists threatened species and communities known or predicted to occur in the various Catchment Management Authority (CMA) sub-regions throughout New South Wales. The list for the Glen Innes – Guyra Basalts CMA sub-region contains a list of 44 threatened species and communities, i.e. 12 threatened plant species, 27 threatened fauna species and five (5) threatened communities.

While many of the threatened species listed for the Glen Innes – Guyra Basalts CMA sub-region have been recorded in the Glen Innes Severn LGA, appear in the NSW Wildlife Atlas for that area and were therefore included in KMA's threatened species assessment, some do not. These species, most of which were predicted to occur in the CMA sub-region but have not actually been recorded there, have been listed in Table 1 of KMA additional information provided as Appendix F of this submissions report. It includes a summary of their preferred habitat, their classification under the TSC and EPBC Acts, and an assessment of their potential to occur in the project area. See also Table 3.2 below.

Table 3.2 above provides a summary of the potential of the additional threatened species to occur in the project area and indicates why these species had not specifically been addressed by the KMA November 2007 report. As indicated above, more details of the KMA review of additional threatened species potential to occur in the project area is provided in Appendix F of this report.

Respondent (A2) statement - The descriptions of which of the threatened species are likely to be affected by the proposal was considered to be inadequate. The likelihood of fauna species to occur in the study area has been included in the flora and fauna assessment. However, the likely impact on these individual species has not been assessed.

The reports of KMA, November 2007 and GRA, August 2007 and January 2008 (Appendices F, G1 and G2 of the Environmental Assessment) provide assessments of the potential impact of the project on relevant species and communities.

Both Kevin Mills and Greg Richards are highly experienced specialists in their relevant fields and have been selected by the proponent due to their relevant experience, their capability in undertaking field surveys and in their ability to provide authoritative advice on the potential impacts of projects such as the Glen Innes Wind Farm.

While the DECC has considered the assessed significance of the project impact on Threatened Species as inadequate, the assessments have been based on significant literature review, survey work and awareness of the potential for significant impacts to occur. The assessments have also made recommendations for mitigation measures to be incorporated in the project which further reduce the potential for impacts on the site's biodiversity.

Table 3.2 Glen Innes–Guyra Basalts CMA sub-region – Threatened Species additional to those described in the KMA Assessment Report November 2007 (Refer Appendix F).

Plant Species	Common name	Potential to be present in project area (see KMA report - Appendix F for more detail)
Eucalyptus mckieana	McKie's Stringybark	**Low** - The species was not recorded in the project area and the location and the geology there appear to be unsuitable for the species.
Eucalyptus rubida subsp. barbigerorum	Blackbutt Candlebark	**Low** - This species was not recorded in the project area and the ridges where the wind farm is located appear not to provide suitable habitat.
Goodenia macbarronii	Narrow Goodenia	**Low** - The species was not recorded in the project area during survey and is not likely to occur there; there is no suitable habitat
Picris evae	Hawkweed	**Low** - Unlikely to occur there due to the intensive grazing of the area and the fact that the project area is outside the known range of the species
Polygala linarifolia	Native Milkwort	**Low** - No suitable habitat in the project area
Rutidosis heterogama	Heath Wrinklewort	**Low** – Not recorded in the area and the habitat appears unsuitable
Birds		
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	**Low** – Nnot likely to occur in the project area.
Poephila cincta cincta	Black-throated Finch (southern subspecies)	**Low** – Not likely to occur in project area
Grus rubicunda	Brolga	**Low** – There is little chance that Brolgas would occur in the project area
Burhinus grallarius	Bush Stone-curlew	**Low** – Not expected to occur there, Species was not observed during traverses of the area
Stictonetta naevosa	Freckled Duck	**Low** – Not likely to occur in the project area, lacking suitable habitat.
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	**Low** – May occur but not observed and no previous records in the locality
Rostratula benghalensis	Painted Snipe	**Low** – Not expected in the project area as lacking suitable habitat
Lathamus discolor	Swift Parrot	**Low** – Lack of records and rarely seen so far north. Any occurrences regarded as incidental.
Frogs		
Litoria booroolongensis	Booroolong Frog	**Low** – No suitable habitat in project area
Litoria castenaea	Yellow-spotted Bell Frog	**Low** – No suitable habitat in project area
Reptiles		
Hoplocephalus bitorquatus	Pale headed Snake	**Low** - No suitable habitat in project area
Plant communities		
Mckies Stringybark / Blackbutt Open Forest		Not located within the project area
New England Peppermint (Eucalyptus nova-anglica) Woodlands on Basalts and sediments in New England Tableland Bioregion		Occurs near Rose Hill Road, but not within wind farm site
Ribbon Gum Mountain Gum, Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion community		Most common woodland/forest type in woodland area of the wind farm. A few scattered Yellow Box trees here and there-Refer Appendix E

Further information to support the outcome of the respective specialist assessments is provided below:

- Woodland vegetation can be mostly avoided and over the 8 kilometres of the Waterloo Range a maximum of only 50 trees will be removed. The maximum number at any one location would be 15 trees. This impact will be addressed by establishment of offset vegetation as shown in Appendix E.
- The offset strategy (Appendix E) will be formalised as an offset plan prior to commencement of construction works
- Rock outcrop vegetation will mostly be avoided and there is likely to be a net increase in rocky areas that will be suitable for reptile habitat and for establishment of rock outcrop vegetation.
- Some native grassland – native pasture will be impacted by the development but this will be in part be offset by the additional woodland areas that will develop a native understorey.
- KMA stated that "*No threatened plant species were found in the area and none are expected to occur on any site impacted by the proposed wind farm*".
- The location of the threatened fauna was attributed by both KMA and GRA to be associated with woodland areas. The woodland areas will be subject to only minor impact as a result of the project implementation. On this basis KMA assessed the project as "*unlikely to place a viable local population of any threatened fauna species at risk of extinction*".
- Greg Richards has provided 7 part tests of significance for three bat species identified at the site and concluded that "*there would be little likelihood that the proposed wind farm would impact upon bat populations, especially threatened species*". Nevertheless he has specified controls for any clearing of potential habitat trees.
- The KMA survey indicated that there were low levels of bird activity at the site and stated that "*After a review of the species potentially present and observations at the site in the context of the nature of the proposed development and its setting, the impact of blade-strike on birds at the Glen Innes Wind Farm is expected to be negligible*".
- KMA also provided a set of recommendations to minimise the impact of the project on the areas of ecological sensitivity that he had identified during the detailed site survey.

The proponent is of the view that comprehensive assessments of the ecological sensitivities of the site have been undertaken and that the proposed mitigation measures and significance assessment are well informed. Provided the project is implemented in accordance with the specialist recommendations and with the development of the Native Vegetation Offset Plan it is considered that the overall project impact will be acceptable.

3.8.3 DECC comment on description of dominant vegetation types (Issue 13)

Respondent (A2) statement - Section 6.6 of the (KMA) Flora and Fauna Assessment states, "Virtually all of the remnant woodland in the project area is endangered". The DECC has acknowledged that the vegetation communities and the vegetation at each turbine site have been described, however they feel that the map (Figure 3) does not contain enough information to determine the extent of individual vegetation communities. The areas of each community that will be affected by the proposal also need to be quantified to enable calculation of adequate offsets.

DECC recommendation: A map should be provided depicting individual vegetation communities that are identified in the text, and the extent of each vegetation community to be impacted, quantified in the document. This may require additional figures focusing on individual or groups of turbines and access roads to assist in reviewing the extent of communities and associated impacts.

In response to the DECC recommendation, the distribution of the vegetation communities identified by KMA including forest-woodland, rock outcrop and native and exotic grassland or pasture is shown in a set of figures provided in the Native Vegetation Offset Strategy Report that forms Appendix E of this

Submissions Report. The additional figures are complemented by a set of representative photography combined with KMA descriptions for the respective sub-areas.

The KMA Assessment Report, November 2007 described each individual turbine site in detail, including the vegetation on and around each site. In regard to the vegetation potentially affected along the access routes, this is described in detail in sections 4.2.3, 4.2.4, 4.2.5, 4.2.7 and 4.2.8 of the KMA 2007 report. KMA considered that the detail in the assessment report and mapping of woodland areas shown on Figure 3 of that report allowed a full appreciation of the vegetation of the area and of that which could be impacted by the proposal. Nevertheless further detail has been provided in Appendix E of this report in the form of representative photography, maps of vegetation distribution and quantification of impacts on vegetation communities for respective parts of the site.

It is noted that most access routes avoid removing any significant area of forest or woodland and those locations where limited woodland clearing is involved are identified in Figure 1 of Appendix E of this report. The wind farm arrangement as shown in the Environmental Assessment will have very little impact on the woodland. Additionally, the areas of rock outcrop are small and scattered and can mostly be avoided. Overall the project could result in a net increase in the extent of rock habitat that could support additional reptile habitat and the vegetation community currently present on rocky outcrop areas.

The maps provided in Appendix E address the DECC recommendation (in respect of DECC Issue 13) and will be subject to further review in conjunction with the contractor's development of the final design arrangement where necessary in conjunction with specialist assessment of the potential impacts and confirmation of specific mitigation measures and quantification of the extent of native vegetation offset to account for the project's impact based on the final design.

3.8.4 DECC Comments on Offset Strategies (Issue 14)

Respondent (A2) statement - The exhibited documents do not contain an offset strategy, additional mapped detail of the native vegetation to be cleared, nor quantified estimates of the removal of each community.

DECC notes that the proponent has avoided native vegetation where possible and has included mitigation measures. The Environmental Assessment addresses the issue of offsets by proposing that the proponent will liaise with the landowners to identify a suitable area that could be fenced off for the duration of the project. Such an area would support native woodland conservation as a measure to compensate for the removal of a limited number of trees at several sites within the project area.

The offset area will be of relatively good natural quality and include representatives of Ribbon Red Gum and Yellow Box. An offset strategy should be included as part of the assessment so that its adequacy in maintaining or improving biodiversity can be analysed in relation to the overall negative impacts on flora and fauna.

DECC also sought that the areas of each community that will be affected by the proposal need to be quantified to enable calculation of adequate offsets. In particular it is noted that up to 8m wide access tracks are required to allow transportation of oversize vehicles – in particular the proposed 50m transport length needed for the movement of turbine blades. In steeper grade areas as identified in the report and where remnant vegetation remains eg. turbines 10, 17, 18, 19, 20B, 21B, 22B, access may be significant removal of vegetation to access the turbine location during construction. Detailed assessment of these locations in particular should be provided including detailed maps outlining proposed access routes in these locations to determine the extent of impact.

DECC recommendation: An offset strategy should be included as part of the assessment so that its likely effectiveness in maintaining or improving biodiversity can be analysed. Additional mapped detail on clearing of remnant vegetation in areas of steeper grade / remnant vegetation should be included to allow adequate assessment of these impacts. Quantified estimates of removal of each vegetation community are required.

As indicated in the previous sections, the proponent has provided an Offset Strategy as Appendix E of this submissions report that provides details of the site mapping accompanied by a set of representative photography and figures showing distribution of relevant vegetation communities. The Offset Strategy also provides quantification of the likely impacts on the respective communities but notes that the actual impact will depend on the final project design. Provided that Project Approval is obtained, a Native Vegetation Offset Plan will be developed and implemented prior to commencement of construction of the wind farm.

While a number of areas have been identified as options for establishing an offset area (Figure 7 of Appendix E) it is noted that the confirmation of one or more suitable areas for providing a native vegetation offset will require further consultation with the respective landowners and input from a flora and fauna specialist as to the availability and suitability of the potential offset areas. It is proposed that the actual offset area would be developed after receipt of Project Approval and in response to the final design for the project and assessment of the extent of impact on areas of reasonable quality native vegetation predominantly woodland remnants but potentially also including areas of good quality native grassland.

Subject to a suitable native vegetation offset being identified and agreements being put into effect, the proponent undertakes to support the protection of the offset area throughout the project life in accordance with the Native Vegetation Offset Strategy provided in this submissions report and the Offset Plan to be developed prior to construction.

The Flora and Fauna management sub-plan of the Construction Environmental Management Plan will deal with the issue of mitigating impacts of the construction works on flora and fauna. That plan will also set out a protocol to limit introduction of weeds to the various parts of the site and include a process to identify and control any weeds that are exacerbated by the works associated with the wind farm.

3.8.5 Request from Department of Planning for additional information

In addition to the comments of the DECC the Department of Planning in its letter of 6th April 2009 sought the following information:

- Mapping of individual vegetation communities (superimposed on the project footprint)
- Quantification of the area of each community to be impacted
- Provision of an offset strategy

In response, the proponent has provided the following items in the attached Offset Strategy document (Appendix E):

- a review of the project footprint
- overview of flora for the region and the project area
- review of the impacted communities supported by photographic review of impacted areas; turbine sites, access routes and substation site in conjunction with the ecological specialist's description of the flora of the respective sites
- quantification of the impacts on respective communities
- map showing areas where remnant woodland may be impacted
- Proponent's native vegetation offset strategy

The information provided in the Appendix E (native vegetation offset strategy document) addresses the Department's request as well the DECC recommendation (Issue 14) and is considered to provide a suitable reference for establishment of an offset plan following Project Approval being gained and prior to the commencement of construction.

3.8.6 Comments by the Nature Conservation Council

The Nature Conservation Council (NCC) indicated in its letter submission, that it is supportive and encourages development of environmentally friendly renewable energy supplies but notes that aspects of the surrounding local environment must be paid due consideration. In particular it raises the following issue in respect of biodiversity.

Endangered Box Gum Community and the Manna Gum/Snow Gum/Mountain Gum Community:

Although the majority of the Waterloo Range site has been extensively cleared in the past for grazing purposes, some remnant woodlands still exist. These house the endangered Box Gum as well as other populations of important flora including the Manna Gum, both of which provide important habitats. The EIA recommends a flora and fauna assessment to identify any constraints and establish mitigations measures.
Recommendation: a more thorough assessment process should be undertaken to ensure all potential impacts of jeopardising these remnant woodlands are minimised.

The NCC does not appear to have fully reviewed the flora and fauna assessment of Kevin Mills and Associates (KMA). Reference to that document will show that each of the impacted areas has been assessed and that aspects of ecological sensitivity have been identified as areas to be avoided. These aspects that were identified in the KMA report have been addressed in the proponent's amended Statement of Commitments (Appendix B) and the Construction Environmental Management Plan will need to ensure that the commitments are observed by the project contractor. It is expected that the appointed Environmental Management Representative will oversee this aspect.

3.8.7 Conclusions in relation to Biodiversity issues

This submissions report addresses matters raised by the DECC and NCC and provides additional information as requested in the Department's letter of 6th April 2009. Subject to development of a native vegetation offset plan during the pre-construction phase of the project and its approval by the Department it is considered that there are no significant biodiversity issues that should prevent the project proceeding.

3.9 Heritage Issues

The following sections deal with aspects of respondent submissions that relate to Aboriginal and non-Aboriginal heritage issues.

3.9.1 DECC response in respect of Aboriginal heritage issues

DECC comment on Literature Review (Issue 15). The Department of Environment and Climate Change (DECC) noted that the issues raised in the adequacy check in relation to the literature review were not addressed in the EIS **(should read Environmental Assessment)** ***. The principle reason for raising the issue is that the significance of any Aboriginal object found during an assessment should be determined in relation to the known local and regional archaeological record. In this regard the significance or otherwise of the isolated find referred to in the current EIS*** **(should read Environmental Assessment)** ***as an axe blank made of local basalt (GIWF Site 1) should have been assessed in relation to its potential to have been sourced from the Gragin Peak site near Inverell identified by Isobel McBryde (McBryde, 1974; Binns and McBryde 1972)***

as a stone hatchet source and featured in her seminal models of prehistoric trade and exchange networks.

Recommendation: The significance of the Aboriginal object identified as (GIWF Site 1) should be considered in light of the local and regional archaeological record, and in light of Aboriginal community viewpoints prior to the implementation of any management or mitigation proposal for this site.

As part of the Glen Innes Wind Farm heritage assessment, McCardle Cultural Heritage obtained a DECC site and report search that entailed a 10km radius around the entire study area which they indicated has been previously considered more than appropriate by DECC. No sites or reports are registered within that 10km radius. It is not possible to undertake a local or regional literature review if no reports are available and no sites have been recorded. MCH undertook the literature review with very limited resources and this is fully acceptable given the lack of information. In addition to this, the registered groups hold no contemporary social and spiritual attachments and given the availability of basalt throughout the region, the artefact raw material may have derived from anywhere and it is not possible to determine its origin.

The DECC's reference to Gragin Peak (east of Warialda) and northwest of Inverell involves a separation distance of the order of 100 kilometres from the wind farm site (see figure below, Gragin Peak is above the 'upper 4' in the figure below.

At this stage it has not been confirmed whether the single Aboriginal object (GIWF 1) identified by the site assessment will be disturbed by the construction works. Should the final project design involve the disturbance of the location where the Aboriginal artefact was identified then it is proposed that the item and its immediate surrounds be further assessed in conjunction with the salvage of the object in consultation with the DECC and the Glen Innes Local Aboriginal Land Council. The Statement of Commitments reflects this position.

DECC comment on consultation with Aboriginal community (Issue 16). The DECC notes that in relation to the issue of Aboriginal community consultation the EIS (Environmental Assessment) provides no written documentation support for the findings and recommendations of the cultural heritage assessment from the local Aboriginal community. Also, as more fully identified below, further attention to the development of a strategy to mitigate harm to GIWF Site 1 is warranted; particularly given the current statutory obligations of the proponent and this will require ongoing discussion with the local Aboriginal community.

Recommendation: The proponent provides written evidence of support for the cultural heritage assessment from the local aboriginal community including any options for management of the isolated find site that arise out of the determination of the overall significance of this site, and

consideration of the proponents current statutory obligations with respect to Aboriginal cultural heritage.

The assessment of Aboriginal heritage issues for the proposal was undertaken by McCardle Cultural Heritage in conjunction with the Glen Innes Local Aboriginal Land Council (GILALC). Two members of the GILALC were involved during the field survey of the site. GILALC was involved throughout the project and at no time during and after the survey did the numerous conversations relating to the project and their cultural heritage, were any indications of contemporary social and spiritual attachments made.

The GILALC was provided with a copy of the McCardle Cultural Heritage report on the findings of the site assessment and comments of GILALC were sought on the report and any issues which the GILALC wished to raise. Prior to submission of the Environmental Assessment, the GILALC did not provide any comments on the report or provide a report of their impressions of the site cultural heritage values. McCardle Cultural Heritage is able to provide copies of all letters to GILALC if required by the DECC.

During the preparation of the Submissions Report, Aurecon discussed the assessment report with GILALC to seek confirmation in writing of the GILALC agreement to its findings, recommendations and proposed management. A brief response was obtained from Mr Trevor Potter as Chief Executive Officer of the Glen Innes Local Aboriginal Land Council on 12th May 2009 and is attached as Appendix H of this submissions report. The detail of the GILALC response is shown below.

"I have read the report on Glen Innes wind farm the only concern that I have is the ridge lines would have been used by hunting parties and request that when excavation on the sites commence utmost care will need to be taken as most Aboriginal Cultural remains are buried underground."

It is proposed that prior to the construction earthworks commencing that the proponent meets with the GILALC to discuss the process for the earthworks in respect of the final design and any particular areas of sensitivity and the proposed management of the works in respect of indigenous heritage matters.

Overall the project is considered to be able to be impacted without affecting known sites of archaeological or cultural sensitivity due to the following reasons.

- the project is likely to be able to avoid disturbance of the single identified site (GIWF 1)
- if the final design involves disturbance of Site GIWF1, then works at that location would not occur without further consultation with DECC and GILALC.

DECC comment on additional issue - statutory requirements of the NP &W Act (1974).
The development has been lodged under Part 3A of the Environmental Planning and Assessment Act (1979) [the Act]. Under section 75U of this Act there is no requirement for a developer to seek an Aboriginal Heritage Impact Permit (AHIP) under sections 87 or section 90 of the National Parks & Wildlife Act to allow for the removal and/or destruction of an Aboriginal object. Therefore the recommendation of the cultural heritage assessment to seek a s90 AHIP is not warranted. However the DECC requires that formal management of this site occurs within the context of the development. Options for this management might mean simple avoidance of impact to the object or that, in consultation with and support of the local Aboriginal community, the object be salvaged and placed in a safe location for long term protection. Irrespective of the management option determined, the proponent is advised that the following statutory obligations with respect to the Aboriginal object identified as GIWF Site 1 are required to be met:

(a) Formal Notification of Aboriginal objects to DECC

It is a requirement under s91 of the National Parks & Wildlife Act (1974) that Aboriginal objects be formally notified to the DECC. If GIWF site 1 has not yet been notified to the DECC then the proponent is reminded that this notification is expected to take the form of submission to the Aboriginal Heritage Information Management System (AHIMS) Registrar of completed Aboriginal Site Cards.

(b) Care and Control of Aboriginal objects

Under s85a of the NP&W Act (1974) Aboriginal objects remain the property [and under the protection] of the crown until formal transfer to an Aboriginal group occurs, and hence the DECC requires clear and certain direction to be provided by the proponent [upon formal consultation with registered Aboriginal groups] as to any proposal for impact, salvage and long term care of Aboriginal objects. To effect proper transfer of Aboriginal objects to local Aboriginal communities it is necessary that an application for a Care and Control permit is made to DECC. This will be required prior to any long term storage of any Aboriginal objects within a "keeping place' can occur.

(c) Notification of salvage and other mitigation measures

The requirement of formal notification of Aboriginal sites also means that for proper record keeping notification of any action taken to remove, salvage and/or place into the care and control of the Aboriginal community any Aboriginal object, should also be provided to DECC as soon as practicable. Proper documentation of these activities remains critical to the long term assessment and management of the cumulative impacts of development on Aboriginal cultural heritage within the region.

DECC Recommendations:

1. *Provide commitment in SoC to a process that facilitates full notification of all sites (those both currently known and any future sites discovered during the operational life of the wind farm) to the DECC.*

2. *Provide commitment in SoC to the full reporting of any mitigation action to be undertaken for site GIWF Site 1. This should also outline the involvement of the Aboriginal community in these mitigation actions.*

3. *Provide commitment in SoC to the facilitation of any application for Care and Control of Aboriginal objects where such care and control is sought by the local Aboriginal community for the object identified as GIWF Site 1.*

The proponent accepts the position indicated by the DECC and the proponent's amended Statement of Commitments is provided with this submissions report (Appendix B) and addresses the above DECC recommendations. The responses in Section 3.9.1 have involved recent liaison with McCardle Cultural Heritage and recent contact with the Glen Innes Local Aboriginal Land Council.

3.9.2 Request from Department of Planning for additional information

The Department in its letter of 6th April 2009 asked that the matters raised in the DECC submission be addressed by the submissions report and encouraged discussion with DECC to ensure that the information in the submissions report fully addresses the issues of DECC. This submissions report provides responses to the DECC matters to the extent reasonably possible at this stage of project planning.

3.9.3 Non-Aboriginal heritage issues.

The respondent submissions included several comments in relation to heritage issues. The respondent comments were included in responses from the Talarook and Waterloo properties in the Wellingrove Valley and Furracabad Station in the Furracabad Valley. The comments are discussed in this section.

As part of the preparation of the Environmental Assessment, Aurecon undertook a review of the heritage features of the Glen Innes Wind Farm locality involving the following:

- Review of readily available heritage articles for the region and locality
- Visit to the Glen Innes Historical Centre and review of local historical publications
- Phone call to Eve Chappell seeking information on any known heritage items in vicinity of Waterloo Range
- Discussion with Wattle Vale residents who described general details of re-alignment of Gwydir Highway over Waterloo Range at about the time of the second World War.
- Inspection of the former alignment of Gwydir Highway on Waterloo Range
- Liaison with the Roads and Traffic Authority (RTA) heritage section in respect of Gwydir Highway heritage aspects and the former highway alignment

Other than the former Gwydir Highway alignment, no items of recorded heritage significance have been identified for the areas to be disturbed by the project.

The former Gwydir alignment was abandoned about 60 years ago and is considered to have some heritage significance even though not identified in the NSW Roads and Traffic Authority heritage register or heritage records. It has been well formed with basalt rock and crosses the top of Waterloo Range along a tree lined route that in places allows glimpses along the range. While it is not proposed to change the alignment of the road or to make significant changes other than improvements to drainage and in places widening if required it is proposed that a photographic register of the former highway alignment be undertaken prior to the commencement of construction works and use of the route for access. The photographic register will be prepared in accordance with Heritage Council guidelines for preparing photographic registers of historic items.

The photographic register would be compiled with a brief report on the known details of the former alignment, its usage and details of realignment of the Highway to its current position. It is proposed that the completed report would be provided to the RTA Heritage Section, the Glen Innes Historic Society and the Glen Innes Severn Council for inclusion in the local library records.

Respondent (D1) statement - We wish to lodge an objection to the proposed Glen Innes Wind Farm on the basis of an irretrievable loss of social and rural heritage value. The Wellingrove valley and its surrounds represent a quintessential rural Australian landscape that is one of the most attractive in the nation and an integral part of our indigenous social and rural heritage that is all too rapidly being desecrated by industrial and urban development. Australian building regulations are universally designed to achieve compatibility with both zoning requirements and physical surroundings. The proposed wind towers are completely inconsistent with both these objectives, representing industrial artefacts that are totally incompatible with the surrounding landscape and located on land zoned rural and rural residential. 'Waterloo' and subsequently the adjacent 'Balaclava' station represent two of the first rural selections in the Wellingrove valley, both of which are preserved today. The valley floor near Matheson was a popular gathering place and battle ground for indigenous tribal groups and these station names (and the range on which the wind farm is located) are derived from one such battle that was witnessed at the time of European selection. Further the 19th Century Australian impressionist, Tom Roberts, painted numerous landscapes and rural subjects in the waterloo area. These works include masterpieces such as 'Golden Fleece'

painted in 1894 at 'Newstead', the original boundary of which bordered 'Talarook' to the west. More relevant in this instance is the painting 'Bailed Up' (1895), which depicts the hold up of the Glen Innes Mail stagecoach near Wellingrove. Other prominent Australian artists and poets have followed in Robert's footsteps, selecting the area to capture its quintessential rural heritage. These masters would turn in their graves at the proposed desecration. Why is it that we worship their works and words and yet fail to value the landscape that so inspired them?

The Talarook Homestead is about 3.6 kilometres from the closest wind turbine near the southern end of the wind farm. All other turbines are progressively more distant with the most distant turbine some 8 kilometres north east of the Talarook Homestead. The wind farm will be within the viewfield of Talarook Homestead and occupy a viewfield of about 69 degrees. It appears that the Talarook residence has a significant number of trees around the residence that are likely to provide a degree of screening of the wind farm. It is however acknowledged that the wind farm is likely to be visible from the respondent's property and from other locations in the Wellingrove Valley.

Due to the distance of the Wellingrove Valley homesteads from the wind farm site, the fact that no works are proposed west of Waterloo Range and on the basis of discussion with a local historian a detailed heritage review was not undertaken for the Wellingrove Valley.

The respondent's statement indicates a rich history for the locality but the proponent does not believe the statement provides reasons justifying the project not proceeding. The wind farm is permissible in Rural Zone 1(a) only with consent and the current process is necessary if consent is to be obtained.

The proposed wind farm will not directly impact any item of built heritage and will be well removed in a geographical sense from the artwork that has been referenced in the respondent statement. Nevertheless the respondent's appreciation of the existing landscape is understood and the only way to avoid the impact on the landscape would be if the wind farm were not developed. However, while today's society wishes to maintain links to our indigenous and more recent non-indigenous heritage, as a nation we are faced with the significant reality of integrating a greater proportion of renewable energy generation. This project is sited at the location due to favourable wind energy, access, grid connection potential and landowner support. The Blayney and Capital Wind Farm localities in NSW have similar levels of heritage significance to that of the Glen Innes Wind Farm locality. However, in neither of those cases was the heritage issue regarded as precluding the wind farm development.

Respondent (D2) statement - The Heritage assessment gives no consideration to the significant European heritage of the surrounding properties. Waterloo Station homestead was built in 1901, and will have a full view of the proposed wind farm. The visual impact of the proposal will have a detrimental effect on the heritage value of this homestead, and should have been considered as part of the Environmental Assessment.

The Waterloo homestead is about 3.6 kilometres from the closest wind turbine at the northern end of the wind farm. All other turbines are progressively more distant with the southernmost turbine some 8 kilometres south east of the most northerly turbine. While the wind farm will be within the viewfield of Waterloo homestead and will occupy about a 60 degree sector of the viewfield from the homestead it appears that a degree of tree screening will reduce the visibility of parts of the wind farm.

Due to the distance of the homestead from the wind farm site and the fact that no works are proposed west of Waterloo Range a detailed heritage review was not undertaken for the homestead or its immediate surroundings.

3.9.4 Conclusions in relation to heritage issues

There have been no heritage issues identified that should preclude the project proceeding. The identified matters are able to be addressed at the pre-construction stage and with appropriate elements included in the Construction Environmental Management Plan. The pre-construction stage would involve preparation of a brief report and photographic register for the former Gwydir Highway alignment and a review of the project design in respect of Site GIWF 1. Should the project final design involve impact on the GIWF 1 locality then further consultation would be undertaken with DECC and GILALC with a view to undertaking salvage of the item according to a salvage plan agreed to by the respective stakeholders.

3.10 Soil and water management

The Department of Water and Energy (DWE) submitted a response indicating support for the project, provided that the points outlined in its letter of 23rd December 2008 are addressed. The matters contained in the letter are listed below.

- the DWE notes the proponent's commitment to preparation of a Soil and Water Management Plan (SWMP) and indicates that it expects to review the plan before it is approved
- the sources of water for construction of the project should be detailed in the SWMP to confirm that they are properly authorised or licensed under water legislation
- the design and construction procedures for cabling/trenching and track/road crossings of watercourses should be detailed in the SWMP and should be consistent with DWE guidelines for Controlled Activities (*available via http://www.dnr.nsw.gov.au/water/legislation.shtml*)
- any special modifications to bridges or road works on stream crossings in NSW to facilitate heavy truck movements to the construction site should also be included
- The SWMP should include measures to prevent or control erosion and sedimentation from roads, tracks, disturbed area and particularly trenching, with regard to high intensity storms on black clay soils
- The SWMP should also include any proposed programs to monitor sedimentation and the risk to stream water quality, stream bank stability and any important pools or water holes.

The proponent believes the proposed recommendations are reasonable expectations for the project and will ensure that earthworks are of effective and practical design to achieve the objectives set out in the Soil and Water Management Plan (SWMP) that will form part of the Construction EMP and that is expected to require approval of the Department of Planning. Development of the Soil and Water Management Plan can also involve consultation with the Department of Water and Environment.

It is noted that the bulk of the project area is located on ridgelines away from watercourses and distant from any lakes. Crossings of watercourses will be required for Seven Mile Creek for the access between Site T17 and T19 and for Reddestone Creek to provide access to the four turbine sites T10, T20B, T21B and T22B. It has been proposed in the Environmental Assessment that a Soil and Water Management Plan be prepared for the project and the development of the Soil and Water Management Plan will be address the consistency with DWE guidelines for Controlled Activities.

3.11 Bushfire

The Rural Fire Services (RFS) submitted a letter response to the Department, dated 26th November 2008 and made comment on the management of areas around buildings as outlined in '*Planning for Bushfire protection 2006'* and the RFS's document '*Standards for asset protection zones'*.

Discussions with Council have indicated that the Waterloo Range is an area of low frequency bushfire events. Nevertheless it is reasonable to expect that adequate safeguards are taken in regards to avoiding initiating bushfires from construction or operational impacts of the wind farm. The proponent also needs to consider the protection of its installed assets from bushfires should they occur. There will be no residents at the substation or turbine sites. The management of fuel loads in bush surrounding facilities in conjunction with a bushfire management plan that addresses biodiversity issues and has been agreed with the Rural Fire Services can be an effective means of managing this aspect.

It is proposed that Construction Environmental Management Plan would incorporate a Bushfire Risk Management Sub-Plan incorporating the controls listed in the Environmental Assessment and the Project's amended Statement of Commitments (Appendix B of this submissions report). The Sub Plan will be developed in consultation with the Rural Fire Services and the indicated documentation. The Sub Plan will also be submitted to RFS for review and approval.

3.12 Impacts on Agricultural businesses

Submissions by respondents included two relating to aerial agriculture (see section 3.11.1) and two from neighbours concerned by the potential impact of the operating turbines on stock (see section 3.11.2).

3.12.1 Impact on Aerial Agricultural business

The submissions in respect of aerial agricultural operations came from:

- Phil Hurst CEO of the Aerial Agricultural Association of Australia (AAAA)
- David Boundy of SuperAir, an aerial agricultural company operating out of Armidale

These submissions raised issues of reduced access to properties for aerial agriculture, increased risk levels, higher costs, reduced profit of the companies and property owners and overall adverse economic outcome.

The AAAA submission intimated that the Glen Innes Wind Farm Environmental Assessment has misrepresented the AAAA's position in respect of wind farm development and indicated that the AAAA had never supported wind farm developments. Aurecon has corresponded with AAAA since December 1996 in respect of proposed wind farm developments and in respect of Crookwell Wind Farm received a letter from the AAAA advising that it had no objection to the wind farm (Appendix G1). Letters were subsequently sent to AAAA in respect of the Blayney, Gunning, Capital and Glen Innes Wind Farms but no response was obtained from AAAA.

In 1998, Blayney AirFarmers was contacted in respect of the proposed Blayney Wind Farm. Blayney AirFarmers provided a very positive feedback and indicated they had no objection to the wind farm (Appendix G2). Blayney AirFarmers was also visited after the wind farm installation and again indicated their support for the development and advised that it was not significantly impacting their business.

During an Information Day for the Glen Innes Wind Farm in December 2007, discussions were held with a pilot working for SuperAir, the proponent, representatives of Aurecon and several potentially affected landowners for the Glen Innes Wind Farm site. The pilot outlined the issues of concern regarding aerial agriculture including the potential for extra costs involved in treating land in close proximity to the turbines. The discussion was useful and provided a basis for discussion of potential for compensation to landowners that could incur increased costs due to the wind turbine presence presenting constraints to aerial agriculture.

Based on the discussions, the proponent undertook to include compensation to the landowners for any additional cost associated with the aerial treatment of their properties due to the wind farm

The respondent submissions also raised a concern regarding lack of consultation with aerial agriculture businesses. However, the issues had been discussed with a local crop-dusting pilot particularly in relation to the matter of increased costs in regard to flights near turbines. The compensation by the proponent to landowners having increased cost of aerial agriculture services for areas currently subject to such services has been discussed with landowners where turbines are located. The areas that may potentially be affected are mostly those owned by wind farmers and possibly the land owned by Daniel McAlary that is partly enclosed (northern, western and southern sides) by land associated with the proposed wind farm. The McAlary land is at a lower elevation and in valleys between ridges where the turbines are located. Given this situation it is expected that aerial agriculture for the McAlary land will not be significantly affected by the presence of turbines on adjacent ridges.

3.12.2 Effects on Stock and pastoral businesses

Two submissions introduced the concept of the presence of the wind farm adversely impacting stock. Mr Daniel McAlary raised the issue of the effect of the wind farm on stock and the greater use of energy by stock due to the disturbance and consequent reduced rates of growth.

Respondent (C6) statement – Failed to provide any information to dispute the common sense view that noise and visual disturbance to live stock will cause them to use energy in avoiding and reacting against the disturbance thus reducing rates of growth.

While the respondent may have a concern about this issue it is less likely to impact neighbours than the actual wind farm properties, if any such effect were occurring. However, the respondent does have land in close proximity to the wind farm site. Even so, the stock on the respondent's property will be at distances from the wind turbines greater than those for stock on the wind farmer properties.

The proponent is not aware that the respondent's concern is substantiated by any evidence and notes that there are many photos available of stock grazing peacefully under wind turbines. Additionally, the wide ranging area covered by stock would mean that any effect, if it occurred at all, could be considered to be of a short term nature and insignificant in the longer term. The concern appears to have been raised to support the overall objection to the wind farm and does not appear to be supported by any detailed evidence in the submission.

Respondent (D2) statement - As noted in the Environmental Assessment, the primary use of the land on the surrounding properties is for rural use. The document states that "Grazing activities on neighbouring properties will not be impacted by the construction or operation of the wind farm." The document lacks any assessment or consideration of the effect that the wind farm will have on livestock or any other agricultural activity. During construction, rock hammers, and possible blasting are proposed, which will have an effect on livestock. During operation, no consideration has been given to whether livestock will be affected by the flicker or noise from the turbines. This could detrimentally affect the grazing potential of the surrounding area, area with significant livestock grazing value.

The respondent is a Director of the Brunswick Agricultural Company and is understood to own the Waterloo Station and various surrounding lands that are used for agricultural purposes. Waterloo Station is over three kilometres from the wind farm site but some of the pastoral lands for this property are understood to occur between the residence and the wind farm site.

The construction phase is a temporary activity and will progress across the wind farm site. There will be a temporary impact on agricultural activities for the lands on which the wind farm construction works occur but no disruption is expected to occur for neighbouring properties as the construction works will be generally set back from property boundaries. It is noted that parts of the Waterloo Station properties are close to the Gwydir Highway and that there will be regular noise associated with large vehicles using the highway. Also some of the parts of Wellingrove Valley appear to be subject to cultivation and large machinery will at times be active in the area. While respondents often quote the quiet nature of the rural setting they often fail to mention the regular use of vehicles, tractors, ploughing equipment, harvesters, pumps, chainsaws, generators, two and four wheel trail bikes and low flying aircraft used for aerial agriculture. While each of these may be used only occasionally it is expected that they are applied as necessary without consideration to affects on stock.

Again once operational if impacts were to occur for stock in close proximity to the wind farm structures then this would be likely to affect the wind farm properties rather than neighbouring lands. Observations at operating sites indicate that stock adapt to the presence of the wind farm structures and they can be regularly seen grazing under turbines and at other times sheltering from the sun in the shadow of towers in hot weather. The respondent's concern does not appear to be substantiated by observations at operating sites.

3.12.3 Conclusions in relation to agricultural businesses

There will be temporary impacts on the conduct of pastoral activities for the windfarmer properties during the construction phase of wind farm development but the construction activities will not impact any of the neighbouring properties. Some additional aerial agricultural costs may arise for parts of the wind farm properties and the proponent will address this issue directly with the wind farm landowners. Most neighbouring properties are unlikely to be adversely affected in respect of the ability to use aerial agriculture for the properties but the property owned by Daniel McAlary that occurs between turbines T22B and T18 will need to be reviewed post installation of the turbines to assess whether the turbine locations are affecting aerial application of fertilisers to that neighbouring land that is partly surrounded by turbines.

3.13 Impact on Property Values

A number of the respondents have raised concerns that their respective land values may be negatively impacted by the development of the Glen Innes Wind Farm. This section reviews the material presented in the respondent submissions relating to land values and the proponents' comments on those matters as well as providing general discussion on the aspect of potential for impact on land values arising from developments in general.

Specific references have been made by some respondents to articles pertaining to the Ballarat and South Gippsland localities some of which are quotes in newspapers that do not represent detailed analyses of the impact of wind farm developments on rural land values.

3.13.1 Respondent comments

Respondent (C1) statement – The Environmental Assessment confirms a high visual impact with large numbers of turbines visible from our home. There is no question that the proposed wind farm will have a negative effect on our property's value. We estimate the likely reduction in value to be between 30 and 40%.

The view of the owners of Cherry Tree (formerly Eungai) that their property's value will be reduced in value by 30 to 40% does not appear to be substantiated by any systematic report of similar impacts on land values at other sites. Reports that have undertaken systematic analysis do not indicate impacts in the order suggested by the respondents and in some cases property values have increased following wind farm development.

The proponent expects that the agricultural productivity of lands within the vicinity of the wind farm will not be affected by the wind farm development on the nearby hills and above the valley floor areas that form much of the agricultural land. However, the respondent appears to use the property primarily as a rural residence rather than for agricultural purposes. Such usage does not appear consistent with the Severn LEP that aims to preserve the productive agricultural potential of the rural land. An objective of the Rural zone 1(a) of the Severn LEP is "*preventing, except in close proximity to village or urban areas, the development of prime crop and pasture land for purposes other than agriculture or horticulture, except where these will not be in substantial conflict with agriculture or horticulture or are otherwise justifiable*". While the Severn LEP objectives do not prevent use of rural land for the purpose for which the respondent is using the land it is considered that the respondent is seeking to attach value to the land based on a purpose that is not specifically intended by the rural zoning under the Severn LEP.

Respondent (C1) statement - Valuers and Real Estate Agents confirm the difficulty selling homes close to turbines. Danny Buttley, Managing Director of PBE Real Estate in South Gippsland was quoted in Victoria's Herald Sun newspaper explaining that selling homes within 2km of Toora's 12 wind turbines was becoming increasingly hard "Anywhere close to the towers is very, very difficult to sell." Mr Buttley said.

The proponent has not undertaken a detail review of the land values in the vicinity of the Toora Wind Farm but notes that the Toora Wind Farm is indicated to have turbines located close to residences at distances of about 600 metres and appears to have been more contentious than other Victorian wind farm projects. The situation in respect of Toora Wind Farm does not necessarily reflect the situation that would occur for the Glen Innes area and is not representative of many other operating Australian wind farm sites.

Respondent (D2) statement - The proposal will have an impact on land prices in the area. The land surrounding the proposal is scenic agricultural land, which affords a peaceful amenity and lifestyle to local landholders and visitors who travel through the area. To suggest that a proposal, which introduces mechanical structures into this scenic rural landscape, will have no effect on property prices is extremely naive.

The respondent from the Waterloo residence located over 3 kilometres from the wind farm also has pastoral land closer to the wind farm. It is not expected that the wind farm will impact the rural productivity of neighbouring pastoral lands and it is not expected that the value of the land is likely to be significantly impacted. It would be difficult to say that there would be no effect and, for a range of potential purchasers of land surrounding the wind farm there could be various views as to the value of the land with an adjacent wind farm.

Respondent (C8) statement – My personal opinion on the issue is that land values will be lowered because of the wind farm being constructed on the proposed location because of the visual impact they will have on the landscape.

The opinion is noted and may be applicable for this respondent but not all potential purchasers will have the same view. Those that are seeking to purchase the land based on its use for agricultural purposes are likely to assess the land based on factors other than the presence of the neighbouring wind farm. Additionally, many people in the agricultural industry have a very practical outlook on the productive use of lands and the proponent has received many positive comments from owners of rural lands in respect to wind energy developments. Many appear to regard wind farms as productive uses

of the land and developers are regularly approached by landowners exploring whether their land may be suitable for a wind farm development.

Respondent (C9) statement - Sales of properties in the local area have already "fallen through" due to the spectre of Wind Farm developments in the region – a 100% reduction in the land value.

The proponent regards the respondent statement as a misrepresentation of the situation. The fact that a sale falls through before being brought to completion is a common situation and the statement that a 100% reduction in land value has occurred is an exaggeration of the circumstances possibly for the purpose of strengthening the basis of the respondent's objection to the wind farm.

Respondent (C9) statement - ***Ballarat-based valuer, Alan Hives has stated that there has now been enough sales of property featuring or near wind farms to draw some conclusions of their impact on property values. In a recent report he stated that "the more intrusive the wind turbines in "lifestyle" terms, the bigger the price impact" on property owners (National Wind Watch, posted 14 November 2008). "In some coastal areas of Gippsland with high lifestyle value, property values had fallen by as much as a third", he states.***

While the Gippsland area has been subject to some wind farm development the installed wind farms are by no means extensive and while conclusions can be drawn for that area they are not necessarily transportable to other areas. The statement that property values in some coastal areas of Gippsland with high lifestyle value have fallen by as much as a third is not necessarily applicable for other wind farm sites. Victoria has been subject to many wind farm development proposals and the Gippsland area appears to have generated more objections to wind farm proposals than other areas of Victoria. There is also potential for misinformation to be propagated. A respondent statement in respect of a valuation example indicated a predicted 27% value as determined by a valuer, Mr Jess. The example is discussed below and indicates that the prediction is speculative rather than factual.

Respondent (C9) statement - We in Furracabad Valley feel that we live here for lifestyle as well as farming and the value of our properties will be substantially diminished by an industrial installation of Wind Turbines. As stated, Aurecon in their report dismiss the impact of wind turbines on the value of our properties however there is evidence to support a significant impact on land values for properties in close proximity to wind turbines.

The Environmental Assessment for the Glen Innes Wind Farm states that "As there have been only a few NSW wind farms developed there is limited quantifiable information available on the impact of wind farm development on land values for NSW." It then provides details of two systematic studies of land values for areas surrounding wind farms based on the Crookwell Wind Farm development and a comprehensive study in the USA.

The Environmental Assessment included the following comment on the Crookwell study. "A review in February, 2006 of the impact of the Crookwell Wind Farm development on land values (based on sales 1990 to 2006) was conducted by property consultants, Henderson and Horning. Their analysis did not identify any measurable reduction in land values.

The Environmental Assessment also referenced a more comprehensive study undertaken for the USA as follows: "In the USA the issue that land values may be impacted by wind farm developments led to a comprehensive and systematic review of sales prices for properties in the viewshed of wind farms developments during 1998 to 2002 and comparison with land values at unaffected locations. During that period the installed capacity of wind farms in the USA increased from 1,848 MW to 4,685 MW, an increase of 2,837 MW. An analytical report entitled "The *effect of Wind Development on Local Property Values*" (Sterzinger *et al*., 2003) was prepared under the Renewable Energy Policy Project (REPP) in May 2003. The report involved studies of various aspects of land values and reviewed data for some 25,000 property sales. Only wind farm projects of greater than 10 MW were considered by the REPP

project. In addition, the review sought projects where there would be sufficient sales data to derive statistically meaningful conclusions from the data.

The REPP report indicated that property values for those properties within a wind farm viewshed have increased faster than those properties outside the wind farm viewshed. While it is difficult to expect the situation to be consistent between areas the case for a negative impact on land values does not appear to be confirmed. Nevertheless, it can be expected that the decisions of some potential purchasers may be affected by the presence of a wind farm and they may decide to purchase elsewhere. While the evidence does not support the conclusion that wind farm development leads to reduced land values it is not unusual for neighbours to developments whether they are wind farms or other developments to have concerns about changes to the existing environment and the concerns about impacts on land values to be a source of anxiety for neighbours to such developments.

Respondent (C9) statement - A valuer from Yarram Victoria, John J. Jess, AAPI, Certified Practising Valuer and member of the Australian Property Institute, has completed extensive research and appeared as an expert witness at the proposed Bald Hills Wind Farm development.

For evidenciary purposes, we can discuss one such valuation. Mr Jess completed a valuation in 2006 on a property in Devon North, positioned in close proximity of a Wind Farm. The valuation was based on 2 criteria:

> ***1. Market value of the property on the basis of ignoring any detrimental effect due to proposed wind farm on adjacent land, and***
> ***2. Market value assuming the proposed wind farm to be constructed on adjacent land.***

The value of the property under criteria 1. was $350,000.
The value of the property under criteria 2. was $255,000.
A decrease in market value of $95,000 or a 27% decline in market value for this property. (Data based on Valuation dated 22 March 2006 of a property in Bolgers Road, Devon North. We hold this document but for privacy reasons, have not included it as an attachment. For confirmation Valuer J. Jess & Associates Pty Ltd. can be contacted or we also hold this document, available for perusal, if required.)

The example provided by respondent C9 is based on predictions of the impact on land values that have not been confirmed and which do not appear to be consistent with other studies of land values before and after wind farm developments have occurred. A cursory review would indicate that the example appears an exaggerated portrayal of the impact on land values. A more detailed review of the example quoted in the respondent submission has been provided in a Victorian Planning Panel Report.

The Panel Report for the Bald Hills Wind Farm of May 2004 reported the situation as follows: *"the Panel considers that if one is to advance evidence that a particular form of use or development will cause a measurable decline in valuation on adjacent or nearby properties with credibility, it is essential to at least review the state of knowledge of market performance of similarly situated properties near equivalent constructed uses.*" The Panel indicates that "*Mr Jess did not do this and so his valuations remain little more than speculations.*"

"*It also appeared to the Panel from Mr Jess' responses to questions that he may have overvalued the amenity, lifestyle and development value premium argued to apply to rural land in the vicinity of the project site, by assuming what amounted to the 'right' to subdivide the many larger holdings down to the 40 hectare subdivision minimum. He did not appear to be familiar with the subdivision provisions and particularly the decision guidelines in the Rural Zone."*

A further extract from the Panel Report states that, "*All that appears to emerge from the range of submissions and evidence on valuation issues is the view that the effect of wind energy facilities on*

surrounding property values is inconclusive, beyond the position that the agricultural land component of value would remain unchanged. On this there appeared to be general agreement. It therefore follows that it has not been demonstrated to the satisfaction of this Panel that significant value changes, transfers or inequities would result from the project proceeding."

The Panel also explored the differences between the objectives and provisions of the Victorian planning scheme Rural Zone as distinct from a residential zone and indicated that the provisions may limit the degree to which the planning system can be used to protect residential amenity in the Rural Zone.

In the matters considered by the Bald Hills Wind Farm Planning Panel, valuation considerations were indicated as not being relevant to a permit decision, as a matter of law and that the only basis for provision of compensation in the Victorian planning system is where land is reserved for public use.

It is understood that the Bald Hills Wind Farm in Victoria has been approved but has not yet been constructed. It is also noted that the valuer, Mr Jess comes from Yarram and that a wind farm development was proposed in the vicinity of Yarram. Some of the turbine sites were indicated to be close to residences and it appeared that there was significant objection to the wind farm development in the Yarram area. We are not aware that the apparently contentious wind farm project has proceeded to development in the Yarram area.

Respondent (C9) statement - Many farmers and adjacent neighbours to the proposed Glen Innes Wind Farm will have permanent capital losses on their properties. Such losses significantly impact key areas such as a farmer's capacity to borrow, the cost of borrowing and their capacity to provide adequately for themselves in retirement. Values for rural land can be split into two broad components:

1. ***Agricultural value – the value which is paid for the current and potential agricultural earning capacity of the land, plus its rural amenity (being able to enjoy living in a rural area).***

2. ***Locational value unrelated to its agricultural value – this relates to its value from being located in an area of high visual or other amenity, and its proximity to local towns, schools, universities and medical care etc. People wish to "get away from it all" (built up areas, including industrial areas), and enjoy unspoiled natural rural beauty, both during their active family life and in retirement years.***

Factors such as these are very important is setting the locational value that buyers are prepared to pay over an above agricultural value.

The proponent acknowledges that the land value of rural land may be affected by a number of factors including those listed in the respondent's statement and as repeated above. Some of these factors will clearly be unaffected by the wind farm development. Other factors may be subject to different responses from a range of individuals and the respondent's statement appears to give more credence to an adverse impact on capital value than is justified by the available information.

The agricultural value of neighbouring lands as derived from the productive capacity of the land will not be affected by the wind farm development. Also in terms of land being in proximity to local towns and facilities, such towns may be positively affected as a result of additional business which could lead to additional business growth which may marginally improve access to services in the local areas.

However, some people may choose land other than that which incorporates views to wind turbines and as such there may be a reduced number of purchasers available and some increase in the time taken to sell the land where the owner is prepared to wait for a suitable offer. As is the case in most property

sales where the landowner seeks a quick sale there is potential for a reduced price to be obtained (lesser value realised).

Respondent statement (C9) The Broken Hill area (where a substantial wind farm is proposed) is located in extensive (as opposed to intensive) farming country in Western New South Wales where land has limited agricultural use but little or no locational value. The extensive nature of the farming involves larger sized properties so that population and housing density is low and it is possible to site a wind farm power station away from houses, stock handling facilities and the general vicinity of neighbours. The comparative barren terrain is ideal for such a development. Because agricultural productivity and the rural amenity of neighbours are not greatly altered, the wind farm has little impact on land values.

The Silverton proposal, north west of Broken Hill, is a large wind farm proposal that is an unusual development in that it is located in an area of poor wind resource (see NSW Wind Energy Atlas) and distant from load centres apart from the City of Broken Hill and the associated Mines. The Sydney Morning Herald article of 8th October, 2007 referred to in the respondent (C9) submission indicates that Epuron's Silverton Wind Farm could be up and running by the end of 2009. The statement has clearly been very ambitious as it is understood that the project is still seeking planning approval.

While the respondent (C9) regards the wind farm site as '*comparative barren terrain*' and being '*ideal for such development'* there are many references to the scenic merit of our inland country. Most parts of NSW have some intrinsic landscape value and the key difference for the Broken Hill area is the lower density of settlement away from the main centres. While land values may be lower for rural areas near Broken Hill if land values are affected by wind farm development then surely land values may be affected to a similar degree whether in Broken Hill or Glen Innes locality.

Respondent (C9) statement - The Broken Hill development may be contrasted with the Glen Innes area where land has considerable agricultural and locational value by reason of its location in a beautiful rural setting, within 2 ½ hours of the coast, 4 hours from Brisbane and 6 hours from Sydney, with airline access being an hour from Sydney to either Armidale or Inverell. Property sizes are of course smaller in the Glen Innes region and range from less than 100 acres to properties of several thousand acres and population density is higher. Grazing productivity is also commensurately higher.

The respondent has emphasised a number of aspects of the Glen Innes locality that provide reasons for its greater land value than the Broken Hill area. Most of these factors will be unchanged by the development of the Glen Innes Wind Farm. Grazing productivity and access times to Brisbane and Sydney will still be the same and provide the same support for land values that are currently experienced even with the development of a wind farm at the locality.

An interesting comment by one of our Councillors recently said that really, we should be grateful for the wind farm as our rates would decrease. Clearly this would be a result of a reduction in the rateable value of our land! Therefore, he acknowledged the fact that our land would reduce in value. This has also been the case in the South Gippsland Shire where the Council has reduced the rateable value of some properties by as much as 40% as a result of their proximity to, and the effect from, the wind farms.

The statement by the Councillor appears unusual but may have been offered as an alternative view to a concern being expressed to the Councillor by concerned members of the local community. As the information on reduced land value does not appear to be confirmed then the case for reduced rates does not appear to be justified.

The example of up to 40% reduction in rateable land indicated by the respondent has not been reviewed by the proponent and is expected to be a limited example and not generally applicable. The

proponent has not conducted a systematic review of changes in rateable values of lands adjacent to a range of Australian wind farm projects and is not aware of such a review.

Respondent statement (C9) - If one was in doubt about the reduction in neighbouring property values, just ask yourself, if you had a choice of purchasing a property with, or without, a neighbouring wind farm, which would you prefer. If you would prefer a property without the neighbouring wind farm, what would entice you to buy it with a wind farm next door. There can only be one incentive – money – a reduction in price!

The other factor driving land values is the supply/demand situation and for a person to choose a property other than one adjacent to the wind farm they would be likely to do that on the basis of preference that could involve a range of factors. In the case of the properties owned by respondent C9, the Furracabad Station properties, these cover an extensive area of land with diverse outlooks and land aspect and quality. The presence of the wind farm to the north of these lands may not be regarded as a significant factor to prevent a potential purchaser proceeding to purchase a very productive and attractive tract of land were it available for sale.

Respondent statement (C9) - To further support our position, we have included some further comments.

- ***Blot on the landscape – Danny Buttley, Victoria (Australia) Herald Sun, 21 Feb 04: "Bruce Richards, Managing Director of PBE Real Estate in South Gippsland, said Victoria's property boom was going backwards in the shadow of the giant turbines. He said selling homes within 2km of Toora's 12 wind turbines was becoming increasingly hard. 'Anywhere close to the towers is very, very difficult to sell,' he said.***

  South Gippsland Shire mayor David Lewis said rate valuations had decreased on some properties near turbines, but could not confirm if it was just due to wind farms. But there was no doubt they had depressed the immediate property market. 'My personal belief is that it does destroy property values,' he said."

- ***Turbines Cast Shadow Over Land Values: Paul Sellars, Weekly Times, 16 APR 2003... "Three prominent agents have told The Weekly Times that existing wind turbines -- and the prospect of more to come -- have turned potential buyers off properties. PBE Real Estate co-founding director John Evans said in 35 years working in South Gippsland, he had never seen a bigger threat to property values than wind farms... Wesfarmers Landmark Leongatha agent Glen Wright said wind farms were "definitely" having an impact on values. If they are near the property, buyers are staying away," Mr Wright said. "If I had to put a figure on it, I would say (a reduction of) 25 to 30 per cent on the going value."***

  Pat Rice Hawkins Pty Ltd sales manager Bruce Falk said potential buyers were turned off by the prospect of wind turbines... 'I would have shown 50 or 60 people through that property and I would say half of those wouldn't even look at the place once they realized it's in the vicinity of wind turbines,' Mr Falk said...The agents' claims were rejected by the Australian Wind Energy Association." This is no surprise!

Reference to Toora wind farm (see first item) does not appear representative of the circumstances applicable for other Australian wind farm sites.

Respondent statement (C9) - There is a strong argument to say that no one would ever consider buying this property. The value of properties within close proximity of wind turbines ARE impacted.

This statement by the respondent does indicate significant anxiety by the respondent but appears to considerably exaggerate the significance of the issue. The statement that "no one would ever consider buying this property" must be considered as an extreme view of circumstances.

Respondent statement (C9) - In summary, our main point in terms of Land Valuations is that Governments and Approval Authorities must give due consideration to the appropriate location of wind farms, preferably away from populated areas. But where developments are proposed in areas like Glen Innes on the top of the Waterloo Range, then specific setbacks from affected homes must be adhered to. We are proposing a minimum setback of 2 kilometers from affected homes.

It is the proponent's view that the Minister through the Department of Planning gives serious consideration to appropriate location of wind farms and potential impacts. Such consideration may not necessarily result in fixed setback distances from homes but would be likely to seek a result that provides appropriate protection of amenity as determined by the Minister after review of significant supporting evidence.

Respondent (C9) statement - There is also the matter of Common Law remedy, that if an owner's land value diminishes as a result of an action by a neighbour, litigation and damages are the remedies. This will certainly become an issue if the development proceeds in its current form, and the Council reduced an affected party's rates. There is also a remedy for loss of land value through Common Law nuisance – loss of value to real estate.

It is not clear to the proponent that the statement by the respondent is in fact correct. The proposal would only proceed if approval is legally granted and is required to be implemented in accordance with project approval conditions. Such approval does not necessarily provide guarantees in relation to neighbouring lands other than conditions that form part of the approval. The proponent is required to implement the project in accordance with the approval and its conditions.

Respondent (C10) statement - Sales of properties in the local area have already been affected by the spectre of Wind Farm developments in the region. Ballarat-based valuer, Alan Hives has stated that there had now been enough sales of property featuring or near wind farms to draw some conclusions of their impact on property values.

In a recent report he stated that "the more intrusive the wind turbines in "lifestyle" terms, the bigger the price impact" on property owners (National Wind Watch, posted 14 November 2008). "In some coastal areas of Gippsland with high lifestyle value, property values had fallen by as much as a third", he states.

A previous item in this report reviewed a respondent (C9) statement in respect of a claim of 30% reduction in land value and the Victorian Planning Panel's conclusions as to significance of claims of reduction of land values. In addition, the comparison of the coastal areas of Gippsland with the Furracabad Valley locality in the above statement is not supported by the respondent submission.

Respondent (C12) statement – Currently I own 1670 acres at "Bindanoon" and "Elm Vale", both situated in the Furracabad Valley. This land has recently been valued at $3,000 per acres without improvements such as houses and woolsheds etc. The proposed windfarm will devalue this land for future subdivision which has always been an option for larger landholders as Furracabad already has small holdings = so called lifestyle blocks.

Elm Vale is about three kilometres from the wind farm site while Bindanoon is four to five kilometres from the wind farm site. There does not appear to be evidence provided in the respondent submission that a reduction in land value would occur and the potential for subdivision and its approval will be a matter to be determined through local Council. As indicated in a response to another respondent

statement it is evident that the land values are in part attributed to agricultural productivity and also indicated to be due to the Glen Innes locality being favourably located between Brisbane and Sydney.

Respondent (C14) statement - We believe, and all our research has shown, that the value of our 'lifestyle property' will decline once the wind turbines are built. To that end we have had our property valued NOW and, if the even that such turbines are built, will have it valued again. Should the value have decreased due to the difficulty of selling because of the wind turbines and their nuisance value, we will have no other choice than to seek redress in this matter'

The Environmental Assessment has included a review of the Highfields property which is the closest occupied residence to the wind farm and has a pleasant rural setting. The closest turbine was indicated by the Environmental Assessment to be at a distance of 0.96 kilometres but recent GPS coordinates obtained for the residence location indicate that it may be at a distance of 1.03 kilometres to the nearest turbine.

Highfields will have filtered views to the wind farm but will also have an outlook to the north east that is unaffected by the wind farm and woodland views to the east and south east. The photomontages (Plates 1 and 2) provided with this report indicate that a number of turbines are visible but that screening by mature trees also limits visibility of some turbines from the residence. The view of the respondent that the value of their property will decline has not been confirmed. The respondent's indication of 'research' that has led them to the view that a decline will occur may have been unduly influenced by negative articles that have in a number of cases been shown to be based on unsubstantiated information. The attractiveness of the setting of the Highfields residence will still be a feature of that location whether or not the wind farm proceeds.

Respondent (C14) statement - Several discussions with property valuers' and real estate agents have all been consistent in their appraisal of the value of our property if the wind farm is established - the value of our property will decrease a anywhere from 25 to 45%.

The estimates of reduction in land values have not been confirmed and are only the views of valuers that may have reasonable local knowledge but are less well placed make judgements on impacts of wind farm projects on neighbouring properties. A Victorian Panel Report describes one such statement by a valuer as speculative and did not place any reliance on it. Furthermore the Panel also considered whether the issue of a decline in land value, if it could be reliably predicted, should be taken into account for a planning permit decision.

Respondent (D1) statement – There are numerous published cases in Australia and internationally where windfarm development have resulted in decreased property values and associated financial lost. I also understand that there are two more relevant instances where property sale negotiation have been terminated by prospective purchases once details of the proposed Glen Innes windfarm were made known, and that property agents are prepared to testify to this end.

Information on previous studies of land values for properties in the vicinity of wind farm developments include the following.

USA – The Renewable Energy Policy Project (REPP) was presented in May 2003 at the American Wind Energy Association annual conference, WINDPOWER 2003. The analysis reviews data on property sales by three different methods to determine if the presence of turbines had any influence on the selling price of properties. The study found no evidence that property values decreased as a result of the wind farms.

1. The Effect of Wind Development on Local Property Values, Renewable Energy Policy Project (REPP) May 2003. http://www.repp.org/articles/static/1/binaries/wind_online_final.pdf

UK - The Royal Institute of Chartered Surveyors and Oxford Brookes University has found no clear relationship between the proximity of wind farms and property prices. The report was published in March 2007 and investigates three wind farms in Cornwall built between 1991 and 2000.

2. What is the impact of wind farms on house prices? P Dent and S Sims of RICS and Oxford Brookes University, March 2007. www.rics.org/Environmentalandlandconsultancy/Energy/Renewableenergy/Wind%20farms%20FiBRE.html
3. Impact of Wind Farms on Residential Property Prices – Crystal Rig Case Study, Edinburg Solicitors Property Centre, February 2007. www.espc.com

Australian examples *(Extract from - Crowlands Wind Farm Planning and Environmental Report, Volume 1 Planning Application – 20 June 2007)*
There is no evidence in Australia to suggest that the value of properties with views of distant wind turbines, are adversely impacted by the wind farms. In Esperance WA, an informal investigation was made into property prices at Salmon Beach, a premier residential area 200m from Australia first wind farm. Of fifteen (15) properties investigated, only one reduced in value after the wind farm had been constructed. This was due to the property being subdivided and sold as two separate lots.

In the interests of investigating the effect that Challicum Hills Wind Farm has had on property values in the vicinity, Pacific Hydro engaged locally-based Property Valuer, Robert McAlpine, to examine the possible effect on land values.

The investigation also established a baseline for pre-wind farm property values at Crowlands to enable subsequent investigation of the possible effects resulting from the wind farm in due course. The report found that land on and around the Challicum Hills Wind farm has increased substantially in value over the period from 1997 (before any knowledge of its potential for a wind farm) to 2007 (after completion of the project). Average value increases were in excess of 400%. This increase in value was experienced notwithstanding the drought conditions. The boost to land values was attributed to the strong interest in the land for Blue Gum forestry plantations and the wind farm. While the consulting Valuer was unable to separate these two influences on values it is worth noting that the higher and drier ridges (suitable for wind farm) are unsuitable for Blue Gum forestry and the flat plains are not sought for wind farm development. The report of RJ McAlpine (2007), Land value effects of wind farms near Ararat is indicated to have concluded that the creation of the wind farm has had a beneficial effect on the value of the land.

The following extract relates to the proposed Bald Hills Wind Farm and is sourced from a report '*Social, Economic and Tourism Impact Assessment for the Proposed Wind Farm Project at Bald Hills, PREPARED FOR Wind Power Pty Ltd by Offor Sharp & Associates Pty Ltd, October 2003)*'
Regarding the potential impact of the project on property prices, from a review of international and Australian data relating to the effect of wind farms on property prices, and discussions with real estate agents, it was concluded that while the USA experience indicates a positive impact on the property prices in the view shed of wind farms, the local experience is ambivalent. There is certainly a reluctance to purchase when faced with an uncertain view from a rural residential block, but land primarily used for agricultural production appears to have been least affected. It appears that, on the balance of evidence, wind farms do not adversely affect property values once they have been established. There is little doubt that the uncertainty associated with the establishment of a new wind farm can adversely affect the market in the short term, but after construction and commissioning of the existing wind farms there appears to have been be little or no adverse impacts on prices. In the Bald Hills area, the reluctance to purchase may be more related to uncertainty than a long term demand impact.

Respondent (D2) statement - The proposal will have an impact on land prices in the area. The land surrounding the proposal is scenic agricultural land, which affords a peaceful amenity and lifestyle to local landholders and visitors who travel through the area. To suggest that a proposal, which introduces mechanical structures into this scenic rural landscape, will have no effect on property prices is extremely naive.

The proponent does not agree with the respondent statement for the reasons provided in respect of other similar items in this section of the Submissions Report.

3.13.2 General discussion of potential impacts on land values

It appears that many types of developments will raise the prospect of the potential impact on property values for neighbouring properties. While the impact needs to be considered it appears to be a risk that is faced by all property owners and the question is whether that property ownership supports a right to restrict development, for which consent may be legally obtained, on adjoining lands. It can be considered that impact on neighbouring property value in itself does not constitute a criterion against which new developments should be assessed but rather the actual impacts and in the words of the respondents 'nuisance' arising from the development.

While respondents have raised the concern that their property values may be adversely impacted by the wind farm development it appears that to gain the surety that they are not impacted, the landowners for the land on which the wind farm would be located would need to forego the income that they would obtain through the wind farm development. This would mean that the wind farmer landowners would be unable to access the opportunity to maximise the productivity of their land.

3.13.3 Conclusions in respect of impacts on land values

There does not appear to be any definitive position on the impact of wind farm development on land values. Some studies have shown no discernible effect, a US study has shown increase in land values and several other sources claim that reductions in land values have occurred. With regard to the Glen Innes area, the respondent statements indicate that there are a number of positive factors that support favourable land values and it is possible that these may over-ride any negative perceptions of the wind farm that may affect some purchasers. The case for a significant adverse impact on neighbouring property values does not appear to be confirmed.

3.14 Community Consultation

The local community has raised the issue of inadequate consultation by the proponent and the respondent statements identify aspects that respective respondents believe were deficient, inaccurate or misleading. Consultation has been a particular concern for property owners in the Furracabad Valley as indicated by respondent statements.

This section provides a review of matters relating to respondent's comments regarding perceived deficiencies in the proponent's community consultation program as raised in respondent statements following the public exhibition of the Environmental Assessment.. The respondent concerns include matters such as:

- No direct consultation with some specific neighbours
- The substance of consultation not being sufficient and inadequate feedback obtained
- Timing of consultation events inappropriate and notification of events being insufficient
- Lack of response from proponent to neighbour's correspondence
- Difficulty in obtaining hard copies of the Environmental Assessment
- Neighbours not being integrated into the process for modification of the project

The proponent's response to these and other matters raised are set out below.

Respondent (C1, C10) statement - The Director-General's requirements include consultation with the local community and state that, "The Environment Assessment must clearly describe the consultation process and indicate the issues raised by stakeholders during consultation and how these matters have been addressed."

The Environmental Assessment has provided a description of the consultation process undertaken and indicated the issues raised by stakeholders during the consultation. The matters raised during the consultation as indicated in the Environmental Assessment have been considered during the preparation of the Environmental Assessment (Refer to Table 4.5 and 4.6 of the Environmental Assessment). Most of the matters of concern to the local community have been addressed in some form by the Environmental Assessment with key aspects being subject to comprehensive assessment. Additional information is also provided with this submissions report where matters raised by respondents warrants additional information being provided.

Respondent (C1, C9, C10) statement - In the Environmental Assessment Certification, Mr Warren Murphy, the Director of Glen Innes Wind Power certifies that the Environmental Assessment accurately represents the consultation undertaken and that the Environmental Assessment does not seek to materially mislead. Mr Jeff Bembrick from Aurecon also certifies that the Environmental Assessment addresses the Director-General requirements. We dispute the above certification and believe that community consultation by Glen Innes Wind Power Pty Ltd and its consultants Aurecon Pty Ltd has been grossly inadequate. The premise that the Environmental Assessment accurately represents the consultation undertaken is false.

The respondents do not accept that adequate consultation was done and in other comments point out discrepancies in the Environmental Assessment. These are discussed below and where necessary, clarification is provided. However, consultation was undertaken with a broad section of the local community and opportunities were provided for a wider section of the community to be involved, not all of which were taken up by the local community. Overall the description in the Environmental Assessment is considered to be a reasonable representation of the consultation undertaken.

Despite the respondents' claims of inadequate consultation the proponent has been able to understand the concerns of the local community. As a result, issues of variation to equipment models, turbine relocation or removal and redesign of the array have been considered by the proponent. However, to date the proponents' reviews have not resulted in significant variation to the proposal. It would appear that the inability of the proponent to identify an alternative array that is more consistent with the local communities suggested modifications (removal of up to ten turbines) has been the main ongoing concern of the local community.

Respondents (C1, C10) statement - The Environmental Assessment claims that Glen Innes Wind Power consultants:

- ***Had consulted "with neighbours to the wind farm and with the local community" Vol 1, Ch 2, Page 8.***
- ***Had consulted "neighbouring landowners within 3km of the wind farm" Vol 1, Ch4, Page 19.***
- ***Visited "many of the neighbouring residences" Vol 1, Ch4, Page 20.***
- ***Had discussions with neighbours to the wind farm site within about 3km in mid 2007- "to explain the proposed development and its potential impacts and identify any concerns that neighbours may have" Vol 1, Ch4, Page22.***

Each of these claims is incorrect.

Respondent (C10) statement – It is difficult to see how it could be written honestly. This section of the Environmental Assessment appears to be a glossy wash up written to dress up a perfunctory investigation and claim an alleged close personal involvement to satisfy the Environmental Assessment requirements.

Several of the phrases extracted from the Environmental Assessment by respondents were taken from tables or bullet point items and as such were abbreviated statements of circumstances. The third bullet point "*many of the neighbouring residences*" together with the second bullet point "*neighbouring landowners within 3km of the wind farm*" represent the consultation undertaken. This could have been better portrayed in the Environmental Assessment.

Figure SR8 shows the locations of residences that were visited or alternatively where the neighbours were not visited but some other contact was made (via open days or phone conversations).

The clarification of this situation is that many of the occupants of residences within 3 kilometres of the wind farm were visited. It is also true that not all residences were visited. Where residences were not occupied and the landowners live elsewhere these persons were not consulted during the visits to residences. Nevertheless, these people also had an opportunity to attend Information Days held in Glen Innes. It has been indicated that some people did not attend the Information Days because they were overseas at the time or were elsewhere in Australia managing their other landholdings. It is also possible that some may not have attended due to other family, business, sport or social circumstances. In these cases printed material was provided to community members for distribution to non-attendees.

Respondents (C1, C10) statement - Visits to and discussions with neighbours to the proposed wind farm by Ashley Peake and Phil Evans in February and March 2008 found that the vast majority had not been consulted and that the vast majority were not supportive of the proposed Glen Innes Wind Farm in its current configuration.

It would appear that the visits referred to by the respondents included many persons outside the 3 kilometre zone targeted by the proponent for the one to one consultation with neighbours to the wind farm site. Accordingly, the view of the respondents is biased toward a specific sector of the local community adjacent but in some cases further from the proposed wind farm.

Respondent (C1, C10) statement - The so-called "Planning Update" of December 2007 was poorly publicised and held just before Christmas which ensured poor attendance. Many residents did not receive their invitations to the Information Days until after the event. We received our letter only 2 days prior to the event.

Notifications for the Information Days held on the 14th and 15th December 2007 were provided by letter, local newspaper and community radio advertisements during the week prior to the information days. The letters were sent to neighbours to the wind farm site one week prior to the event with the expectation that they would have been received in advance of the event. With the addition of advertisements placed in the Glen Innes Examiner and on the local Community Radio (three times per day for a week) it was expected that the collected efforts to notify the local community would also have been supported by word of mouth between members of the local community.

As the December, 2007 event was provided on a Friday and a Saturday the proponent expected that this would provide several opportunities for people of various commitments and with an interest in the project to attend on one of the days.

Respondent (C1) statement - Proper consultation should have been undertaken prior to the acceptance of the adequacy of the Environmental Assessment and we have repeatedly alerted the Department of Planning to this deficiency.

While it is acknowledged that the degree of consultation could have been strengthened, it is noted that the Glen Innes Landscape Guardians have been active in the local community spreading the word and conducting their own information sessions in Glen Innes and distributing brochures provided by the proponent and drawing attention to issues of concern for the more involved members of the group.

Together with proponents' visits to many of the residences within three kilometres of the wind farm site, the 2007 Information Days and, distribution of project brochures many of which were either distributed at Information Days or provided to community members to pass onto other community members it is expected that the awareness of the project at the time of the public exhibition of the Environmental Assessment was well developed. In this respect the project arrangement was not a complex design and the material provided clearly indicated the proposed project. Similarly the response of members of

the local community and the concerns raised have been understood and the proponent has been reviewing options for variations to the project that could provide an improved acceptance by neighbours while maintaining a feasible arrangement.

Respondent (C1) statement - The difficulty in obtaining hard copies of the Environmental Assessment has been confirmation of the proponent's lack of real community engagement. We also experienced difficulty and much delay in obtaining promised noise data from our home background noise monitoring.

Copies of the Environmental Assessment were made available in both hard copy format and soft copy format. As is generally the case with most projects these days the number of hardcopies was limited and copies on CD were the more freely available form of the documentation. Despite this the Glen Innes Landscape Guardians was provided a hardcopy of the Environmental Assessment. Two of the hardcopies provided to the Department of Planning were also understood to be passed onto Glen Innes Severn Council and placed on display in the local area at the Glen Innes Severn Council offices and the Council's Library and Learning Centre.

Noise monitoring data was provided to owners of Highfields and Cherry Tree (Eungai). It had been explained to these neighbours that the data alone was of little use other than to indicate the data accumulated at the site. The key reference in terms of noise impacts is the noise assessment that is incorporated in the Environmental Assessment and summarised as Chapter 10 of the Environmental Assessment. The owners of Cherry Tree (Eungai) did acknowledge that the data provided in advance of the Environmental Assessment document was in fact a disappointment.

Respondent (C1) statement - We believe that the false claims of significant community consultation cast doubt on the veracity of the whole Environmental Assessment document.

The proponent regards the respondent's view that the presentation of consultation in the Environmental Assessment invalidates other material in the Environmental Assessment as an extreme view and not justified by the comprehensive material presented in the Environmental Assessment including the range of specialist assessments.

Respondent (C2) statement – The residents of Furracabad were not consulted about the proposed wind farm. I received a visit from the proponent's consultant, Mr Bembrick, about August 07, with a map in his hand, pointing out to me where the turbines would be located and how many would be visible from my home. I would not consider this a consultation at all.

The respondent was visited at their home to discuss the details of the proposed wind farm and the potential impacts on the residence. The meeting involved a lengthy discussion involving the wind farm proposal and a range of other related and unrelated matters over a period of about 45 minutes to an hour. At the time, the respondent expressed support for the renewable technologies and did not appear concerned by the wind farm proposal. Some comments at time of the meeting regarding the wind potential on her property were taken by Aurecon to indicate an interest in having turbines on the property but during discussion with the respondent at a 2008 information day she has indicated that Aurecon has misunderstood her comments at the time. A letter was sent to the respondent inviting them to the December 2007 information days, however they did not attend the event. The respondent did attend the information days held in November 2008 during the exhibition period and was present at the meeting with the Glen Innes Landscape Guardians.

Respondent (C5) statement – The proponents of this project state that they have carried out extensive consultancy with residents within the Furracabad Valley.

We have received no contact what so ever from the developers until the 30th October 2008 when they advised that their environmental assessment documents will be on public display for six weeks prior to submission to the government planning department. Our residence although

well within 5 km of the nearest turbine is not shown to exist or acknowledged in any of the proponent's documentation. If ambiguous statements of this nature are quoted one wonders if other ambiguous statements are included in the environmental assessment documents to reduce possible negative slants and to indicate they have thoroughly conducted their assessment and planning.

As previously mentioned, visits to residences were mainly confined to within 3 kilometres of the proposed wind farm although some visits to residences beyond 3 kilometres did occur. The respondent's (Carl and Lilian Toovey) residence is over 4 kilometres from the proposed wind farm. The Open Days held within the Glen Innes community were designed to inform and receive input from the wider community. The respondent did not attend the 2007 Open Days.

The respondent's view that the presentation of consultation in the Environmental Assessment invalidates other material in the Environmental Assessment is regarded as an extreme view and not justified by the comprehensive material presented in the Environmental Assessment including the range of specialist assessments.

Respondent (C6) statement – The developer has adopted a non consultation approach, failing to do the most obvious things, to even properly assess the real impact of the development on neighbours. These in summary include:-

- ***Failing to take any neighbouring land owner or resident to a wind farm of similar scale and size (such as the wind farm the developer has erected near Blayney in NSW) so that the person might become familiar with wind turbines and wind farm arrays; (the proponents of the wind farm at Ben Lomond have done this).***

- ***Failing to contact for the purpose of consultation major neighbouring land owners to the wind farm at any stage to the 28th November 2008. To my knowledge prior to 29th November 2008 neither, the developer nor its consulting engineers had any consultation with either my father Frank McAlary or my mother Patricia McAlary in relation to their holdings. My parents reside in inner Sydney within 4 kilometres of the offices of NP Power they are listed in the phone directories and easily contactable.***

- ***The Environmental Assessment wrongly asserts community support for the project. I have noticed in the report by Aurecon the assertion that the farm has broad community support. I note that petitions of 600 signatures have been presented to the Parliament of NSW against the development by the Hon Richard Torbay MP Speaker and member for Northern Tablelands.***

To clarify, Blayney Wind Farm is not a wind farm that was developed by the proponent for the proposed Glen Innes Wind Farm. That being said, there have been very few wind farms constructed in NSW to date. The completed wind farms in NSW include Blayney, Crookwell, Hampton and Kooragang Island Wind Farms and consist of fewer turbines with the turbines being smaller than those proposed for Glen Innes Wind Farm. Capital Wind Farm, which is currently under construction, consists of turbines of a similar scale to that proposed at Glen Innes and would therefore be a more appropriate NSW site to visit once operational in the latter half of 2009. The proponent has not ruled out the possibility of organising a site visit to another site for the closer neighbours to the proposed wind farm.

In relation to point 2 of the respondent's statement, Mr Frank Stratton McAlary QC was not visited as part of the visits to the neighbours for the reasons explained to him at the meeting with the Landscape Guardians on 28th November 2008 and listed below:

- It is understood that Mr Frank McAlary was aware of the project as he was one of the first landowners approached in regard to possible siting of turbines on his property. It is also

understood that he rejected the offer for turbines at the time due to commercial reasons rather than for any reasons in regard to their impact
- It was understood that he was not a resident in the area at the time visits to neighbours were occurring
- The project had been discussed with his son, Daniel (who is a resident at Lombardy) and daughter, Suzanne (who is a resident at Cherry Tree, formerly Eungai)
- There were four Information Days, two in December 2007 and two in November 2008. Mr McAlary was asked why he did not attend the December 2007 Information Days and to this he replied that he was too busy with his extensive Kimberly properties in Western Australia.

Similarly to Mr Frank McAlary, it is understood that Mrs Patricia McAlary is not a resident at the wind farm locality but would have been familiar with the wind farm development through the family connections. An occupant of Mrs McAlary's Klossie residence (Debbie Burton) was visited and the project discussed with her. The location of turbines relative to the residence was indicated by Aurecon, from the front yard of Klossie, as well as outlining the expected impacts. The resident did not appear concerned by the proposed development. Her contact details were taken to keep her and her husband informed of the proposed development.

In relation to point 3 of the respondent's statement, the concern by neighbours from various sectors of the community is indicated in several places throughout the Environmental Assessment document. However, many people who discussed the project with Aurecon were positive about the development, including some neighbours to the wind farm while others were non-committal or ambivalent.

Respondent (C8) statement – The consultation process that was carried out in my opinion left a lot to be desired as we were on* (not?) *told where the turbines were going to be installed with no input whatsoever in the early stages.

The proponent did not undertake a personal visit to the respondent's home as it is 4.7 km distant from the wind farm site. The respondent did not attend the 2007 Open Day. An invitation to the 2008 Open Day was not taken up.

The information on the location of the turbines was first presented in the Preliminary environmental Assessment of March 2007 and the amended layout was shown in the information brochure dated November 2007 and in displays at the December 2007 information days. At the early stages the location of turbines is poorly informed due to the lack of sufficient reliable wind energy data and prior to details of equipment being clarified. Accordingly consultation is better informed as the project planning progresses with the maximum information availability occurring for the public exhibition of the Environmental Assessment and involving considered responses by the potentially impacted community based on the publicly available documentation.

Respondent (C9 & C10) statement - The table below indicates the degree of visitation and contact made to immediate neighbours to the wind farm prior to December 2007.

Sue and Russell Hargreaves	***Moonarie***	***Not consulted***
Margaret Lynn and Terry Walsh	***Bindanoon***	***Not consulted***
Kristen and Steven Lynn	***Corra Lynne***	***Not consulted***
Carl and Lillian Toovey	***Santa Rosa***	***Not consulted***
Beth Winter	***Mayfield 1***	***Visited but not consulted***
Brian and Nerolie Winter	***Mayfield 2***	***Not consulted***
Harold and Irene Fletcher	***Avondale***	***Not consulted***
Michael and Penni Sloman	***Elm Vale***	***Not consulted***
Phillip and Jenny Rhodes	***Lecole Pas***	***Not consulted***
Lyle Perkins	***Tralee***	***Not consulted***
Ian and Val Donaldson	***Glenawarra***	***Not consulted***
Daniel McAlary	***Lombardy***	***Not consulted***

Frank McAlary	***Lombardy/Wandsworth***	***Not consulted***
Patricia McAlary	***Klossie***	***Not consulted***
Craig and Debbie Burton	***Klossie***	***Visited but not consulted***
Geoff Putland/Christine Thompson	***Furracabad Station***	***Not consulted***
Geoff Putland/Christine Thompson	***Oakes/Furracabad***	***Not consulted***
Greg and Di Bruce	***Carrington Park***	***Not consulted***
Suzanne McAlary	***Cherry Tree***	***Visited but not consulted***
Mary-Anne Evans	***Highfields***	***Visited but not consulted***
Barry and Patti Williamson	***Glenfield***	***Not consulted***
Craig Thomas	***Valeview***	***Not consulted***
David and Nancy Hutton	***Rosefield***	***Visited but not consulted***
Bob and Kerry Crothers	***Ilparan***	***Not consulted***
Val King	***Willow Glen***	***Not consulted***

The December 2007 "Planning Update" indicates in Section 5 of that document that "A program of community consultation has been initiated with consultation with neighbours". Table 1 clearly shows that this has not been the case. (Appendix 7(of respondent's submission))

The respondent's statement misrepresents the circumstances of the consultation undertaken. It is agreed that not all of the people listed in the respondent's table were consulted. The Proponent's clarification based on records maintained is found in Table 3.3 below.

Table 3.3 – Proponents clarification of consultation for entries in respondent (C9, C10) table

Neighbours Name	Property	Respondent's comment on consultation	Proponent's comment
Sue and Russell Hargreaves	*Moonarie*	*Not consulted*	Discussions with Sue at Information Day 2007 and brief discussion with Russell in field in May 2007
Margaret Lynn and Terry Walsh	*Bindanoon*	*Not consulted*	4.5 km, residence not visited. Unable to attend 2007 information Day, sent information on request in December 2007. Margaret attended 2008 Information Day and discussed potential impacts
Kristen and Steven Lynn	*Corra Lynne*	*Not consulted*	Visited Corra Lynne several times, no one at home. Did not attend Information Days in December 2007 or November 2008.
Carl and Lillian Toovey	*Santa Rosa*	*Not consulted*	4km, residence not visited. Invitation to 2008 Information Days not accepted
Beth Winter	*Mayfield 1*	*Visited, NC*	Visited in mid 2007, attended Information Day 2008 and LSG meeting 28/11/08
Brian and Nerolie Winter	*Mayfield 2*	*Not consulted*	Attended Information Day 2007 and LSG meeting 28/11/08
Harold and Irene Fletcher	*Avondale*	*Not consulted*	5.1 km distance Not Consulted
Michael and Penni Sloman	*Elm Vale*	*Not consulted*	2.9 km distance. Tenants not consulted, owner is Margaret Lynn, correspondence and discussion as above for Margaret and Terry Walsh.
Phillip and Jenny Rhodes	*Lecole Pas*	*Not consulted*	3 km distance. Not consulted. Did not attend December 2007 or November 2008 Information

Neighbours Name	Property	Respondent's comment on consultation	Proponent's comment
			Days.
Lyle Perkins	*Tralee*	*Not consulted*	Residence is > 5 km distance. Not consulted. Did not attend December 2007 or November 2008 Information days
Ian and Val Donaldson	*Glenwarra*	*Not consulted*	Not home when visited in 2007. Discussed with house minders and contact details left. Did not accept written invitation to either the 2007 or 2008 Information Days.
Daniel McAlary	*Lombardy*	*Not consulted*	At 2 km distance, Consulted many times, see notes in Table 3.5.
Frank McAlary	*Lombardy/ Wandsworth*	*Not consulted*	Not consulted but aware of project through family as indicated above and first comments received on 28/11/08. See above for more information
Patricia McAlary	*Klossie*	*Not consulted*	As for Frank McAlary
Craig and Debbie Burton	*Klossie*	*Visited, NC*	Visited Debbie at Klossie, Did not express any concern. Did not accept written invitation to either the 2007 or 2008 Information Days.
Geoff Putland/ Christine Thompson	*Furracabad Station*	*Not consulted*	Not visited, Did not attend any Information Days, attended LSG meeting on 28/11/08
Greg and Di Bruce	*Carrington Park*	*Not consulted*	4.7 km distant from wind farm site. Not visited. Invitation to the 2008 Information Days was not taken up.
Suzanne McAlary and Ashley Peake	*Cherry Tree*	*Visited, NC*	Visited, discussions while establishing noise monitoring, phone conversations, attended Information Days, see Table 3.5 for more details.
Mary-Anne and Phil Evans	*Highfields*	*Visited, NC*	Visited, discussions while reviewing positions for noise monitoring, phone conversations, Phil attended Information Days in 2007 & 2008 and LSG meeting on 28/11/08.
Barry and Patti Williamson	*Glenfield*	*Not consulted*	6 km distant from wind farm site. Not visited. Did not attend 2007 or 2008 Information Days.
Craig Thomas	*Valeview*	*Not consulted*	6.2 km distant from wind farm site. Not visited. Did not attend 2007 or 2008 Information Days.
David and Nancy Hutton	*Rosefield*	*Visited, NC*	Visited in June 2007 and Nancy attended Information Days 2008. Did not appear concerned. Also consulted with their son, Andrew Hutton who attended both the 2007 and 2008 Information Days.

The Environmental Assessment outlines the consultation undertaken and the issues identified through the consultation process as well as proponent's response to the identified issues.

The number of residences surrounding the wind farm site is indicated in Table 10.1 of the Environmental Assessment that is repeated below as Table 3.4. Of the total 27 residences there are 23 occupied relevant residences of which 4 are understood to be vacant.

Table 3.4 – Distribution of residences within 3 kilometres of the wind farm site

Distance from nearest wind turbine	Relevant Receiver (non wind farmer)		Non-relevant (wind farmer)		Totals
	Vacant	Occupied	Vacant	Occupied	
< 1 km	1	1	1	0	**3**
1 km to 2 km	1	5	0	1	**7**
2 km to 3 km	2	13	0	2	**17**
Totals	**4**	**19**	**1**	**3**	**27**

Details of consultation within 3 kilometres of the wind farm are shown on Figure SR8 and listed in Table 3.5 below.

Table 3.5 – Details of consultation with residents within 3 kilometres of the wind farm

Residence	Landowners	Distance (km)	Proponent's comment based on consultation record
Rivoli	Terry Watters	1.9	Visited residence on 28/06/07
Wattle Vale	Ray & June Rossington	1.9	Visited residence on 27/06/07 Attended 2007 & 2008 Information Days. Ray attended LSG's meeting
Girrahween	Neil and Eileen Davis	2.0	Visited residence on 27/06/07 Attended 2007 & 2008 Information Days
Rose Hill A & B	Rex, Julie and Elsie Sheedy (Windfarmer property)	2.4 & 2.1	16/05/07 called Rex and discussed project and noise monitoring 18/05/07 Left message 22/05/07 Several calls to Rex regarding noise monitoring 25/05/07 Noise monitors installed 19/06/07 Removed noise monitors 25/06/07 Spoke to Rex regarding Archaeological survey 27/06/07 Met Rex to discuss project details and access 07/12/07 Spoke to Julie regarding Bat survey 15/12/07 Rex and Julie attended Community Information Day 27/12/08 Met Julie and Elsie to discuss project status
Glengarry	Mark & Kim Lynn	2.1	Visited residence mid 2007
Elm Vale	Michael and Penni Sloman	2.9	Not Visited. Project information sent to owner of property, Margaret Walsh, on request
Mayvona (vacant)	Daniel McAlary / Frank McAlary	0.9	Aurecon has records of the following communications with Daniel McAlary between May 2007 and November 2008: 16/5/07 Phone call to Daniel to introduce the project and discuss related matters

Residence	Landowners	Distance (km)	Proponent's comment based on consultation record
			18/5/07 Phone message left regarding background noise monitoring 22/5/07 Phone call to discuss proposed background noise monitoring 24/5/07 Phone call to discuss visit to Mayvona agreed but cautioned not to enter the building as it was unsafe 25/5/07 Met Daniel at Highfields while setting up noise monitoring equipment 27/6/07 Met Daniel in the field and asked whether he had any further thoughts on the project. He responded that he had not thought about it any further 15/12/07 Daniel attended the 2007 Information Day and discussed the project 28/11/08 Daniel attended the Information day and discussed the project and his concerns 28/11/08 Daniel attended a meeting between the Landscape Guardians and the proponent
Hillside (vacant)	Robert and Annabel Dulhunty (Windfarmer property)	0.8	25/06/07 Spoke to Robert regarding project and Archaeological survey 7/12/07 Spoke to Robert about project details and ongoing management 15/12/07 Robert, Annabel and children attended Community Information Session 27/11/08 Meeting with Robert and Annabel to discuss the project 29/11/08 Robert and Annabel attended the Community Information Session.
Lombardy	Daniel McAlary	1.9	See Mayvona above
Highfields	Phillip & Mary-Anne Evans	0.96	16/05/07 called Phil and discussed project and noise monitoring 18/08/07 Left message regarding noise monitoring 23/05/07 Spoke to Mary-Anne regarding delay in noise loggers 24/05/07 Visited residence, discussed location of loggers 25/05/07 Set up noise loggers 19/06/07 Noise loggers removed 27/06/07 Visited residence, no one at home. Left a copy of the Preliminary Environmental Assessment at residence 10/07/07 Met Phillip at gate to Highfields. Discussed setbacks and visual impacts. 15/12/07 Phillip attended 2007 Information Day 28/11/08 Phillip attended 2008 Information Day 28/11/08 Phillip attended the LSG meeting
Cherry Tree (formerly Eungai)	Suzanne McAlary & Ashley Peake	1.6	Connell Wagner records of communications with Suzanne McAlary between May 2007 and November 2008 are shown below 16/5/07 Phone discussion - Discussed the proposal and various potential impacts. Suzanne described her experiences in respect of

Residence	Landowners	Distance (km)	Proponent's comment based on consultation record
			other locations. 18/5/07 Left phone message re noise monitoring 22/5/07 Phone message - Confirmed time for setting up monitoring equipment, explained what equipment would be installed, the time was arranged to fit in with her husband (Ashley Peake) being present so that he could ask questions about the project 23/5/07 Phone message – advised delay in arrival of noise monitors, Arranged revised time of 8am 24/5/07 again to enable Ashley to be present 24/5/07 Met at Cherry Tree (Eungai) and discussed site for the loggers, kept clear of the house and away form pumps indicated to be in shed to the west of the residence 25/5/07 Set up background noise monitor and weather station, some discussion of project details and potential impacts. Suzanne also arranged for Glen Innes Examiner journalist to visit the site and discuss the project without informing Aurecon of this arrangement Noise monitors were removed by Radek Kochanowski after logging period 27/6/07 Stopped at Cherry Tree (Eungai) to drop off a hardcopy of the Preliminary Environmental Assessment that had been requested by phone. No one at home, later indicated that the family were away in Queensland on holiday. 4/7/07 Phone message from Suzanne McAlary requesting Preliminary Environmental Assessment which was sent by post following the phone call. 11/12/07 Phone call Ashley Peake discussed access to noise monitoring results 12/12/07 Discussed noise monitoring information and a time to meet at the Information Days was arranged for 2.30pm on Friday 14/12/07. 14/12/07 Meeting with Suzanne and Ashley at Library Information Day to discuss project and presentation material in respect of environmental impacts. Additional brochures were provided to pass on to other neighbours that were not able to attend the Information Days A range of phone calls and articles were received during 2008 addressing Suzanne and Ashley's concerns and various correspondence from the Landscape Guardians which was understood to be coordinated by Ashley 28/11/08 Meeting with Landscape Guardians attended by Suzanne and Ashley 29/11/08 Meeting with Suzanne and Ashley at Information Day – Various aspects discussed during the meeting It is also understood that Ashley and Suzanne have held a number of discussions with the Department of Planning and other relevant agencies.

Residence	Landowners	Distance (km)	Proponent's comment based on consultation record
Wandsworth	Frank McAlary	2.3	No consultation with Mr Frank McAlary apart from meeting at Glen Innes Library and Learning Centre on 28 November 2008. Not resident in the area. Son and daughter well aware of project details.
Nullagai	Frank McAlary	2.1	See above comments for Wandsworth
Klossie	Patricia McAlary	2.3	Wife of Mr Frank McAlary. Not resident on site. Attended meeting on 28 November 2009. Son and daughter well aware of project details.
Klossie	Craig and Debbie Burton	2.3	Visited residence on 27/06/07. Residence is tenanted by property manager.
Green Valley (Oakes)	Geoff Putland & Christine Thompson	2.5	Not visited. Indicated by Mr Putland to be tenanted by the property manager. The potential visit to this location was not completed due to inclement weather at the time and poor condition of the access road to the residence in the wet weather.
Ilparran A	SJ & CJ Crothers	1.5	Residence not visited. Phone discussion with landowner in November 2008. Not resident on site. Proponent sent softcopy of Environmental Assessment to Sydney residence. Visited March 2009 and photography obtained for photomontages.
Ilparran B (vacant)	SJ & CJ Crothers	1.4	Visited vacant residence on 28/06/07. Neighbour described residence as in poor condition. Did not continue to Ilparran A residence due to time constraint, wet weather and poor state of road in the wet conditions.
Minamurra A	Mark Ritchie	2.3	Visited residence on 28/06/07. Discussed project with owner and occupant and occupant of neighbouring Minamurra B residence. Mr Ritchie appeared accepting of the project and indicated that it should have gone ahead earlier.
Minamurra B	Mark Ritchie	2.1	Not visited, however discussed the project with the landowner on the 28/06/07 together with the indicated occupant of Minamurra B.
Minamurra C (vacant)	Mark Ritchie	2.5	Not visited, however discussed the project with the landowner on the 28/06/07
Kalanga A	Archie and Jo Cameron	2.2	Visited residence on 28/06/07. Lengthy discussion in house during poor weather. Explained location of turbines but difficult to point out turbine locations on range due to poor weather and low cloud cover.
Kalanga B	Archie and Jo Cameron	2.3	Not visited, however discussed the project with the landowner on the 28/06/07
Kalanga C (vacant)	Archie and Jo Cameron	2.3	Not visited, however discussed the project with the landowner on the 28/06/07
Glengyle	John & Marianne Bower (windfarmer)	1.1	16/05/07 called John regarding project and noise monitoring 18/05/07 spoke to John regarding noise monitoring 22/05/07 spoke to John regarding noise monitoring 24/05/07 Met at residence, spoke about project 25/05/07 Set up noise monitoring 19/06/07 Noise monitors removed 07/12/07 Spoke to John about wind farm layout and ongoing management 15/12/07 John attended Information Day 27/11/08 Meeting with John and Marianne to discuss the project 29/11/08 John attended Information Day

Residence	Landowners	Distance (km)	Proponent's comment based on consultation record
Balaclava A	J & L Nugent	2.9	Not Visited
Balaclava B	J & L Nugent	3.0	Not Visited

Respondent (C10) statement – The Glen Innes Examiner editorial of 13 December 07 opined that "the public consultation process for such large infrastructure projects are sometimes criticised as being tokenistic exercises of window dressing that have no real intention of taking concerns on board" and this proved to be very prophetic.

The information days held on 14th and 15th December 2007 were attended by a proponent representative, Mr Colin Paterson and two members of the Aurecon Environmental Assessment team. A four page brochure was prepared for the event and supplied to attendees. Additional copies were also provided to some attendees to pass on to friends and neighbours that were not in attendance. In addition, a poster display was available for viewing by attendees and questions were addressed by the three proponent representatives at the information days. In addition, contact details of attendees were collected. The attendees were also invited to complete a questionnaire as to their residence location, interest in the project, prior knowledge of the project and any concerns arising. Following the information days additional copies of the brochure were distributed to the Glen Innes Landscape Guardians and to other local stakeholders requesting details.

Respondent (C10) statement – Even Jeff Bembrick, environmental consultant for Aurecon, conceded in the Glen Innes Examiner of 12 June 08 that "community unrest over the development had not been helped by the timing of the information day only weeks before Christmas and it was of concern that it took so long to get mail to some neighbours notifying them."

Mr Bembrick does not recall giving the statement to the Examiner that has been indicated by the Glen Innes Landscape Guardians in their submission response. However, he does believe that it was unfortunate that the mail to areas surrounding the wind farm site had been delayed and notes that mail in the opposite direction appears to only take one to two days to reach its Sydney address. It does appear surprising that in what appears to be a close knit community that with advertising in the local paper, on the community radio and with the mail-out that some members of the local community indicate they were not aware of the information days.

Respondent (C10) statement – The community should have been consulted prior to the development of an Environmental Assessment and prior to the acceptance of the adequacy of the Environmental Assessment by the Department of Planning.

Community Consultation was undertaken in 2007 prior to the draft Environmental Assessment being provided to the Department of Planning in March 2008. The Department of Planning did undertake an adequacy check of the Environmental Assessment in the context of the Director-General's requirements and the assessment presented in the Environmental Assessment. At the stage of accepting the Environmental Assessment for public exhibition it is understood that the Department accepts the Environmental Assessment on the basis of it being adequate for that stage of the process but it also reserves its right to seek further information at a later stage if it considers that is necessary.

Respondent (C9 & C10) statement – Council had expressed concerns (via the now Director of Planning and Environmental Services) that there would be problems with a number of residences in proximity to the turbines at the southern end of the proposal. Despite these concerns and, surprisingly the proponent added another turbine (no 16B) at the southern end.

The Council comments obtained at an early stage of the process have turned out to be accurate and the assessment has directed significant attention to this area. An example of that attention would be the two noise monitors located at close spacing (Highfields and Cherry Tree) to better identify the ambient noise environment in this area particularly for the two closer occupied residences.

The additional turbine site T16B is not one of the closest to Furracabad Valley and is on the western ridgeline separate from the six turbine sites adjacent Furracabad Valley. No new sites were added on the eastern ridges and T18 was moved slightly to the south to be located further from Highfields residence, now understood to be at 1.03 kilometres distance rather than the 0.96 kilometres indicated in the Environmental Assessment.

Respondent (C10) statement – Our letter to N.P. Power Vice President, Colin Paterson, of July 2008 offered to assist in the reconfiguration of the wind farm and find a constructive way forward remains unanswered. Appendix 9.

While the community group's offer of the assistance was appreciated it was sufficient for the neighbours to clearly articulate their concerns so that the proponent could undertake the specialist technical studies to explore options for alternative wind farm arrangements that may enable resolution of the concerns. This process is still in progress and is not a process which could have been undertaken by the neighbours.

Respondent (C9 & C10) statement - The meeting with GILG group on 28 November 08 during the Environmental Assessment public exhibition period was finally an opportunity for us to express our frustration with the poor consultation and engagement as well as dissatisfaction with the turbine configuration. This meeting was attended by 30 of our members and friends of GILG. Hopefully discussions at this meeting will grow into a compromise solution which will allow the wind farm to proceed but protects the rights of nearby residents.

The meeting between the proponent and the Glen Innes Landscape Guardians (GILGs) was a useful opportunity for discussion of relevant issues with a significant proportion of the local community, primarily from the Furracabad Valley. The possibility of varying the project description that has been presented in the Environmental Assessment was raised by the GILGs and the proponent undertook to look at feasible options that could be considered as alternatives to the proposal. Should a suitable alternative wind farm design be identified that allows a viable development of a wind farm at this site then the proponent will give serious consideration to development of that option. It is also possible that the project implementation could involve a lesser impact array than has been considered for the Environmental Assessment either through different equipment being used or a lesser number of turbines being installed.

Even where a suitable alternative is not identified the proponent will need to ensure that the final design is compliant with the Minister's decision should approval be given for the wind farm.

Respondent (C9) statement - The Environmental Assessment in Vol 1, Chapter 4 under "Planning and Consultation" on pages 17, 18, 19, 20, 21, 22 and 23 deals with community consultation. A reading of these pages would convey that an intensive consultation with "all neighbouring landowners within 3 kilometres of the wind farm" has been carried out. This is a FALSE STATEMENT and could not have been honestly written.

Respondent (C9) statement - We are the largest landowners in the Furracabad Valley and Matheson Valley and our property is within 2 kilometres of the proposed wind farm. There has been no consultation visit, telephone call or other communication with us. How could have a genuine consultation been carried out by Aurecon if we were not visited/consulted. We have been completely ignored.

The respondent owns the Furracabad Station group of properties that span parts of the Furracabad and Wellingrove Valleys. Furracabad Station homestead is located slightly outside the 3 kilometres within which visits were made to residences. Additionally Furracabad Station was not regarded as one of the residence locations that was considered to have any significant impact in terms of noise or visual impact as it is south of the southern end of the wind farm and has a degree of topographic and tree screening.

The owners of Furracabad Station properties indicated that they were overseas at the time of the December 2007 Information Days and so were unable to attend these events. The respondent did not attend the November 2008 information days.

Respondent (C9) statement – Our enquiries to other neighbouring properties have also confirmed that no consultation was made with them. The alleged consultation with neighbours in Vol 1, Chapter 4 pages 20-21 did not occur.

As indicated in Tables 3.3 and 3.5 above, consultation with neighbouring residences within 3 kilometres of the wind farm did occur although not all residences were covered. Two separate community information sessions involving a total four days have been held in Glen Innes. The respondent did not attend any of the 4 information day but did attend the meeting between Glen Innes Landscape Guardians and the proponent.

Respondent (C9) statement – The Environmental Assessment also states that the matters raised during consultation have been given serious consideration and adjustment made to the project design to address the concerns of the community. This gives the impression that the communities concerns have been addressed. THIS IS CLEARLY A FALSE STATEMENT. The most important concern raised during the community consultation was the 2 kilometre setback from non-related residences and this has not been listed as a concern, or addressed in the Environmental Assessment.

The matter of the two kilometre setback and the Glen Innes DCP was an issue raised after the Environmental Assessment was submitted to the Department of Planning for review of its adequacy. The issue was subsequently addressed in Chapter 4 of the amended Environmental Assessment that was placed on public exhibition. The issue of a two kilometre set back is also discussed in section 3.6 of this submissions report.

Respondent (C9) statement - It is our opinion that Community Consultation was poorly handled or not undertaken. Aurecon stated that they "consulted" by posting us a letter less than 2 weeks prior to the December 2007, 2 day Exhibition in December 2007. Unfortunately we were away in November and December and not present at Furracabad therefore we did not receive that letter, nor were we able to attend the information days. Aurecon considered that 2 weeks notice of the exhibition was appropriate, as well as conducting it over the Christmas period, when most people were away. WE ABSOLUTELY DISAGREE.

On the basis of the respondent comment, any time during November or December 2007 would have been unsuitable for the project information days as they have indicated they were away for that lengthy period. Despite their absence the information days provided useful communication between members of the local community and the proponent. At the meeting with the GILG's the respondent indicated they were overseas and even had notification been received by them it would appear that they would not have been able to attend the information days. The information days were on 14th and 15th December 2007 prior to school holidays and the time that families could reasonably be expected to have potential to be away on vacations.

It is noted that the respondent did not attend either of the Information Days in November 2008 and indicated that they have visited wind farms and are familiar with them.

Respondent (C9) statement – On the 25th March 2008, we, together with other members of the Furracabad Valley, wrote to Mr Jeff Bembrick of Aurecon, requesting consultation prior to the development of the Environment Assessment document. Our letters were ignored as no consultation occurred. (Copy of the Putland/Thompson letters (from our 3 properties that make up Furracabad Station) to Mr Bembrick are attached at Appendix 4, 5 and 6.).

Letters received by Jeff Bembrick were forwarded to NP Power who is the proponent's representative and the nominated point of contact for the project.

Respondent (C9) statement - The proponent's response to neighbours' concerns are set out in Table 4.6 (Vol 1, Chapter 4, Page 23) under "Neighbours" is nothing short of a whitewash of the issues and we would question the sincerity of their response to the issues raised. ….It would appear that these responses have merely been "lifted" from the wind farm "template" for responses to standard issues raised, and they mean nothing.

Table 4.6 presented in the Environmental Assessment is a summary table only. Each of the issues raised and the subsequent mitigation or proponent response is discussed in detail in each of the relevant chapters of the Environmental Assessment. The issues identified in Table 4.6 correspond with those for which submissions have been received by respondents.

Respondent (C9) statement – It would appear that the proponent partners (Aurecon and Glen Innes Wind Power) had every intention of ignoring efforts to communicate with them, thus setting up a divisive situation which resulted in the very forceful and frank discussions between representatives of NP Power and Aurecon and with members and friends of the Glen Innes Landscape Guardians on Friday 28th November 2008. This could have been avoided, as well as any opposition to the Development, if meaningful consultation and compromise was undertaken prior to the Environmental Assessment Exhibition.

The proponent was appreciative of the need for consultation but at times the expectations of some neighbours were beyond what could be accommodated at that stage by the proponent who was in the process of compiling relevant planning information. The proponent was able to gauge key concerns of the neighbours from the consultation undertaken and it has affected the considerations during planning and these aspects are still being considered.

Respondent (C9) statement – The lack of consultation on behalf of the proponents – NP Power, Pty Ltd, Babcock & Brown Wind Partners Pty Ltd and Glen Innes Wind Farm have shown a flagrant disregard for the concerns and lives of the local community. This is unacceptable in today's environment.

The community has had access to the Preliminary Environmental Assessment from about mid 2007, four information days held in Glen Innes in December 2007 and November 2008, two information brochures provided in conjunction with the information days and through the public exhibition, access to a very comprehensive Environmental Assessment. Additionally, visits were undertaken to many of the residences within three kilometres of the wind farm. The extent of consultation has increased as the project progressed and information has been consolidated. The form of the project is relatively straightforward and while it has been modified (number of turbines increased from 22 to 27) between the time of the Preliminary Environmental Assessment and the Environmental Assessment the project envelope is basically the same. Specific details may still be modified further in conjunction with Project Approval conditions and the award of contracts for specific equipment and works. Any such variation would need to be compliant with approval conditions for the project. Any project variation would be likely to be associated with a lesser impact than shown in the Environmental Assessment.

Respondent (C9) statement – There was no evidence of input sought from the local community. We, as a group and as individuals, certainly had expectations and perceptions of the proposed development and every attempt on our part to discuss this with the proponents or their

consultants was met with a stony silence. This is evidenced in our documented phone calls and letters to both the proponents, NP Power's Colin Paterson, and Jeff Bembrick of Aurecon. They have treated the local community (those that are not hosts of the wind farm turbines at least) with contempt, setting up antagonism and ultimately confrontation.

The proponent has reviewed information provided by the respondents and considered alternative arrangements for the wind farm design. However, the proponent has not yet been able to identify a design that meets the neighbours' expectations and which would form a viable project. The respondent expectations were beyond what the proponent could offer at that stage and discussions reached a stage where they were not constructive.

Respondent (C9) statement – The proponents, consultants and more than 20 members of the GILG and friends met on Friday 28th November 2008. This was well after the completion and submission of the Environmental Assessment to the Department of Planning and half way through the Exhibition period. They met most of the Stakeholders for the first time. Neither the proponents nor the consultants knew one person in the room. This is because they have not consulted with people in the Valley except for the wind farm landowners.

The meeting between the proponent and the Glen Innes Landscape Guardians (GILGs) was a useful opportunity for discussion with a significant proportion of the local community, primarily from the Furracabad Valley.

Despite the view the respondent holds, many of the GILG members and friends who attended the meeting on the 28th November were known to the proponent and consultant. Those not known to the proponent or consultants were from residences beyond 3 kilometres to the wind farm and who had not been visited or attended the community information sessions.

Respondent (C9) statement - The proponents wrote to some neighbours on the 30th October 2008 to advise of the Exhibition period for the Environmental Assessment, from the 5th November 2008 to 17th December 2008 – 6 days prior to the opening of the Exhibition Period. They advised locations for the Exhibition and that the document could be sourced by going to the Department of Planning's website. They also advised in their letter that submissions in response to their Environmental Assessment must be received by the Department of Planning (DoP) by close of business on the 17th December 2008.

The exhibition of the Environmental Assessment was advertised by the Department of Planning prior to the exhibition period. In addition, neighbours were personally notified, by the proponent, of the exhibition period and the two community information days.

The Environmental Assessment was on exhibition for just over 6 weeks which is an extended submission period for a project of its nature. In addition, the Department allowed submission of supplementary submissions up until 16th January 2009.

Respondent (C9) statement – It was impossible for interested parties to obtain hard copies of the Environmental Assessment (3 copies only were provided to some people after considerable effort on their part) and as we at Furracabad Station, who are the biggest landowners in the Furracabad and Matheson Valleys, live more than 2 kilometres from the wind farm, although our property is within 2 kilometres of the proposed wind farm, the proponents did not even provide us with a CD version of the submission. This had to be requested on an individual basis from the DoP, which we did. However, many of the local Stakeholders are older farmers, few even with electronic access let alone an understanding of how to source information on the Net. This is insulting to many of the local farmers and to our mind, unconscionable conduct on the part of the proponents.

As is normal practice for major projects, the Project Application and the associated Environmental Assessment were placed on the Department's website for Major Projects on exhibition.

Hardcopies of the Environmental Assessment were also made available in the Council offices and the Glen Innes Severn Library and Learning Centre for the public to view. These locations were identified in the correspondence sent to neighbouring residences and in the public advertisements.

Residences in close proximity of the proposed wind farm (within 2.5 kilometres) were provided with soft copies. In addition, 3 hard copies were provided to the closest residences following requests for the documentation. The proponent also supplied the Department of Planning with soft copies which were able to be made available to persons requesting information on the project.

The arrangements for the public exhibition of the Environmental Assessment are considered to be standard practice for projects of this scale. The proponent endeavoured to ensure that the Glen Innes community had access to the Environmental Assessment document.

Respondent (C9) statement – In Volume 1, Chapter 4, Point 4.8.1 the Environmental Assessment states that "Planning for the development of the Glen Innes Wind Farm has included specific consultation with the stakeholders listed in Table 4.4.

Sector – Local Community - Organisation or Group – Neighbouring landowners within three kilometres of the wind farm."

Our property at Green Valley (or the "Oakes" property as per the Environmental Assessment) is less than 3 kilometres from the wind farm. We have had no "specific consultation" from anyone.

The respondent acknowledges that the Green Valley (Oakes) residence was not visited during the course of the Environmental Assessment preparation. Some neighbours to the north of the Green Valley residence were visited but visits did not extend as far south as Green Valley due to poor weather at the time, the condition of the access road in the wet weather and time constraints for that visit. Correspondence was sent to the residence inviting the occupants to the 2007 and 2008 community information sessions, however they did not attend.

Respondent (C13) statement – Finally, the high handed attitude of the proponents, NP Power Pty Ltd and their consultants, Aurecon, lack of consultation beggars belief. I have never received any form of consultation except a letter dated 30 October 2008 notifying me of the Environmental Assessment.

It is understood that the respondent is not a resident at the wind farm locality but is expected to have been familiar with the wind farm development through the family connections. The respondent was personally invited to both the 2007 and 2008 information sessions, however neither event was attended.

The tenant of the respondent's property, Klossie (Debbie Burton), was visited and the project discussed with her. The location of turbines relative to the residence was indicated from the front yard of Klossie, as well as outlining the expected impacts. She did not appear concerned by the proposed development. Her contact details were taken to keep her and her husband informed of the proposed development.

Respondent (C14) statement – As it evidenced by this timeline, the consultation process has been a lengthy one however it did not involve the people who will be most affected by the wind turbines. When we requested the information about the noise data collected at our home, through our extension of goodwill, we had to ask repeatedly and then involve the Department of Planning before such data was made available to us.

Noise monitoring data was provided to the respondent, however it had been explained to these neighbours that the data alone was of little use other than to indicate the range of data accumulated at the site. It is acknowledged that the supply of the data was delayed and could have been supplied earlier. The key reference in terms of noise impacts is the noise assessment that is incorporated in the Environmental Assessment and summarised as Chapter 10 of the Environmental Assessment.

As demonstrated in Table 3.5 above, there has been direct consultation between the proponent and the respondent.

Respondent (C15) statement – Glen Innes Wind Farm Pty Ltd has stated they have been in consultation with the residence that would be effected from the start of this concept plan. In fact this to us is a blatant lie or a convenient oversight, as our house falls within the three kilometre range of the site and is located on the main road leading to many of the towers, the only time I have received any communication was by way of letter dated 30/11/2008 just prior to the document being submitted for public viewing to Council and at no other time have they bothered to contact us, our only information has been by purchasing the local newspaper, or by communication with other informed residences, to me this is NOT a consultation process by any means.

The respondent is correct in saying that the residence has not been visited. The respondent's residence was mistakenly identified as Moonarie, and all correspondence would have been addressed as such. This has been rectified in this report. The respondent did not attend the 2007 community information sessions, it was indicated by their neighbour that they were away at the time. Mrs Hargreaves (neighbour) took additional information from the 2007 information day on their behalf. The residence is 3 kilometres from the proposed wind farm.

Respondent (D1) statement – Despite 'Talarook' being significantly impacted (especially from a visual perspective), at no stage has the proponent sought to consult directly with the owners. In assessing the Environmental Assessment, it would appear that the proponent have only sought direct consultation with the owners of land on which the wind towers are directly situated. This approach appears to have been driven more by financial imperative to the advantage of the proponent, rather than resolving any likely impact on surrounding landholders.

'Talarook' is located 3.6 kilometres from the proposed wind farm. While the respondent was not visited at Talarook, an invitation for the 2007 and 2008 community information session was sent to the resident. On neither occasion did the respondent attend.

Respondent (E1) statement – Firstly, the consultation process left a lot to be desired and whilst we were consulted twice in four years in relation to the project, some land owners residing within 2km of the nearest turbine were never approached by the proponents.

As shown in the above Table 3.5, efforts were made to consult will neighbouring residents to the wind farm site prior to the submission of the Environmental Assessment. Where direct consultation did not occur, residents were invited to a community information session. The respondent was visited at their home on the 27th June 2007 where the project was discussed over the period of about an hour. Mr and Mrs Rossington also attended the 2007 community information day and Mr Rossington attended the 2008 community information day and the meeting with the Glen Innes Landscape Guardians.

3.14.1 Conclusions in relation to community consultation

Many of the local community respondents have made a clear statement that they were dissatisfied with the extent of community consultation. The respondent concerns have related to:

- No direct consultation with some specific neighbours
- The substance of consultation not being sufficient and inadequate feedback obtained
- Timing of consultation events inappropriate and notification of events being insufficient
- Lack of response from proponent to neighbour's correspondence
- Difficulty in obtaining hard copies of the Environmental Assessment
- Neighbours not being integrated into the process for modification of the project

The proponent acknowledges that the extent of community consultation could have been increased but nevertheless asserts that significant efforts have been made in respect of consultation and it is unclear whether a more intensive program would have varied the current circumstances in regard to community awareness and concerns in respect of the proposal or the proponent's ability to meet the community expectations of substantial changes to the project.

The proponent's consultation process has been progressed as planning information has developed and enabled more detail to be provided to stakeholders. Its objective has been to assist community awareness of the project, to understand the concerns of the potentially affected community and to review options for mitigating the impacts of the project or varying the project description to improve the acceptability of the wind farm proposal.

The consultation undertaken has included elements of:

- Preliminary Environmental Assessment on the Department of Planning website from March 2007
- Meetings with a range of neighbours to the wind farm site
- Holding four information days in Glen Innes in December 2007 and November 2008
- Collection of attendee contact details and issues and concerns in regards to the project
- Notifications of information days and the public exhibition
- Provision of the Environmental Assessment to neighbours within 2 kilometres of the wind farm site
- Advertising in the local paper and on the local radio. Proponent also interviewed by the ABC
- Single meeting with Glen Innes Landscape Guardians in November 2008
- Preparation and distribution of two brochures on the project. The Update 2 brochure is provided as Appendix I of this submissions report.

The consultation program is considered to have delivered a reasonable part of the consultation objectives but could have been more extensive. Nevertheless, both the local community and the proponent now have a reasonable understanding of the other's position and the challenge for the proponent has been and continues to be the ability to identify a design that is viable for the proponent and regarded as more acceptable to the local community. The project as proposed is considered to be of a form that represents the maximum wind farm development that would be implemented at the location and the installed wind farm based on the final design may result in lesser impact than the assessed proposal.

While the local community has envisaged the consultation involving neighbours being part of the team to redesign the wind farm array this is a technical and commercial process that the proponent has undertaken with the knowledge of the identified community concerns. Glen Innes Wind Power is aware of the neighbours concerns and has considered a number of alternative wind farm arrangements. However, the Glen Innes Wind Farm site has up to 27 wind turbine sites located on a number of discrete ridges that provide limited options for relocation of turbines. Potential for varying the array is

also limited by the property negotiations involved. Options are available to vary the equipment to be installed and that is the subject of ongoing review by the proponent.

The proponent is continuing to review available equipment and options for turbine sites that may improve the neighbour's acceptance of the final wind farm design. As part of this process the proponent has an ongoing dialogue with various equipment suppliers to assess array variations in the context of the potentially available equipment and project viability for various options. Assuming approval is obtained and subject to suitable agreements being reached between the proponent and its contractor(s) a lesser impact development may result. However, even if implemented in the form proposed, the proponent believes that it is suitable for approval of the Minister in the current form.

4. PROPONENT'S RESPONSE TO SUBMISSIONS

Following the proponent's review of submissions that were received from the Department of Planning a number of matters have been identified that require minor modification of the Project Application involving the graphic representation of the properties affected by the project and minor clarifications of details of the project implementation and/or the Statement of Commitments.

This section summarises the key details of the proponent's changes to the project information and assessment following its review of the respondent submissions and the associated issues in the context of the realistic options available for implementation of the proposed wind farm.

4.1 Project Application and Project Description

The project application is varied in respect of the figure showing the properties involved. Please see Figure SR1 that replaces Figure 1.5 of the Environmental Assessment. The details of properties involved do not change and are shown in Table 3.1 of this submissions report.

4.2 Amended Statement of Commitments

The proponent's Statement of Commitments has been amended in the following respects:

- Correction or clarification of project details in the Statement of Commitments
- Clarification of mitigation measures or inclusion of additional mitigation measures

The proponent's amended Statement of Commitments accompanies this submissions report as Appendix B of this Submissions Report.

5. CONCLUSION

This submissions report responds to the comments and issues raised in the 29 submissions received from the local community and NSW Government agencies following the public exhibition of the Glen Innes Wind Farm Environmental Assessment.

The submissions report is structured according to the issues raised rather than by individual respondents. It offers explanation of the circumstances of the issue raised or, where applicable, indicates improvements to the project and its management to address a respondent's stated concern. Some of the respondent's concerns that seek modifications to the proposal have not been able to be accommodated and in those instances, explanations are provided for the proponent's position in regard to the matter.

In some cases, additional advice has been sought from the specialists involved in the preparation of the Environmental Assessment to respond to particular technical matters raised by the respondents.

Based on the review of the matters raised by the respondent's, the proponent's Statements of Commitments has been amended and is provided as Appendix B of this submissions report.

Having considered the respondent statements and reviewed the project in the light of those comments as well as updating and strengthening the proponent's Statement of Commitments it is considered that all relevant issues and concerns have been addressed and that the project should now proceed for approval by the Minister. The submissions report is considered by the proponent to fulfil the requirements of Section 75H of the Environmental Planning and Assessment Act 1979.

6. APPENDICES

Appendix A Letters from Department of Planning requesting specific information
A1 - Department Letter of 29 January 09 requesting review of respondent submissions
A2 - Department Letter of 18 March 09 requesting additional photomontages
A3 - Department Letter of 6 April 09 requesting flora, fauna and heritage information

Appendix B Proponent's amended Statement of Commitments

Appendix C Visual aspects and representative photos for residence locations

C1 – Highfields
C2 – Cherry Tree (formerly Eungai)
C3 – Mayvona
C4 – Ilparran
C5 – Lombardy
C6 – Furracabad Station
C7 – Green Valley
C8 – Waterloo Station
C9 – Wattle Vale
C10 – Lecole Pas (937 Furracabad Road East)
C11 – Green House near Klossie
C12 – Nevada Park
C13 – Talarook

Appendix D Additional photomontages for four residences nominated by Department of Planning

Plate 1	Highfields – View to north-west from north eastern corner of the yard
Plate 2	Highfields – View to south-west from south western corner of residence
Plate 3	Cherry Tree – View to north-west from northern side of residence
Plate 4	Cherry Tree – View to south-west from southern side of residence
Plate 5	Mayvona – View to the south-west from southern side of the residence
Plate 6	Mayvona – View to the north-west from the residence
Plate 7	Ilparran A – View to the east from the residence's driveway
Plate 8	Ilparran A – View to the east from the residence's kitchen window

Appendix E Native Vegetation Offset Strategy

Appendix F KMA - Additional Information – Threatened Species Information - Glen Innes Wind Farm 7 May 2009

Appendix G Prior correspondence with Aerial Agriculture stakeholders

G1 – AAAA correspondence
G2 – Blayney Wind Farmers

Appendix H Copy of email response from Glen Innes Local Aboriginal Land Council 12 May 2009

Appendix I Copy of update brochure prepared for the Planning Update of October 2008 in conjunction with the public exhibition of the Environmental Assessment in November 2008