FATAL DEFECTS IN LIVERPOOL RANGE WIND FARM ENVIRONMENTAL ASSESSMENT

Dr Michael Crawford

September 30th, 2014

The proposed Liverpool Range wind farm should be rejected on strategic grounds and because of fatal defects in multiple essential parts of the environmental assessment. Either of these alone is sufficient to reject the proposal. In combination they are overwhelming grounds for rejection.

Contents

Executive Summary

The proposed Liverpool Range wind farm (LRWF) should be rejected on strategic grounds and because of fatal defects in multiple essential parts of the environmental assessment. Either of these alone is sufficient to reject the proposal. In combination they are overwhelming grounds for rejection.

Strategic Considerations

The proposal will contribute to the rapid escalation of consumer and business electricity prices that has occurred in NSW in the last 7 years, with Sydney consumer electricity prices exploding by 121% in that period. For reasons outlined in the body of the report, the Liverpool Range proposal would contribute to a continuing increase.

Unless the department believes it is NSW Government policy to:

- *raise consumer electricity prices very much faster than by depending on conventional forms of electricity generation; and*
- *impose the greatest hardship from this policy on the lower income segments of the NSW population*

then the proposal must be rejected.

In addition to that, using outdated AEMO forecasts, the EA blatantly attempts to mislead the DPE/PAC about the timing of potential electricity shortfalls for NSW, which AEMO puts ***at least a decade from now***.

Thus, there is not a supply reason to build Liverpool Range wind farm. It only serves the developer's interests in acquiring REC payments while forcing up NSW electricity prices.

So on strategic grounds the proposal must be rejected.

Other Considerations

In a few days, it has been possible to identify numerous other major flaws in the document and in the process preceding it. No doubt the department having more time to review the developer's application will have found many more problems.

The various deficiencies, which are each examined in more detail in the body of this paper, include:

- an atrocious history in relation to community consultation and engagement;
- reliance on fundamentally flawed, general assessment of community support for wind farms as an invalid substitute for local surveys;
- total misstatement of the health risks created by wind farms for some residents;
- an approach to noise evaluation that has historically, repeatedly proved to make false predictions and which, if now accepted by officers of the department without

establishing very rigorous noise compliance mechanisms, would make them personally culpable for future harm to neighbours of the proposed development;

- a Landscape and Visual Impact Assessment that does not follow best practice and is deficient in a number of critical ways and cannot be relied upon;
- the proposal for decommissioning funding is fanciful and essentially an open cheque for more than $100 million drawn on the NSW taxpayer, a critical problem that can be avoided with the quite normal commercial practice of requiring a bank guarantee to cover those costs, entirely removing a $100+ million risk for the NSW taxpayer;
- a blatantly deficient assessment of increased bushfire hazard that makes it wholly unclear what assessment has actually been made by the EA authors as opposed to the RFS itself, but which appears structured to give the impression it is actually a reassuring RFS assessment;
- a number of the consultant reports, in particular the critical noise and visual impact ones, contain caveats that, at face value, indicate the consultants are not prepared to guarantee the validity of the advice tendered and which therefore, the DPE/PAC cannot rely upon and must exclude from consideration.

The fact that such a misleading and deficient environmental assessment could be served up to the department suggests either total disrespect for the department and the NSW Government, or an expectation they are engaged in simply a "tick the box", rubber stamping exercise in which the department is complicit.

Approving this proposal, in the face of this massive list of failures, many of which adversely impact on local residents and on the NSW taxpayer, could only be seen as "improperly exercising official functions in a partial manner"[1] and thus an action awaiting the attention of ICAC at some point in the future.

Dr Michael Crawford
September 30th 2014

[1] See *What is corrupt conduct*? http://www.icac.nsw.gov.au/about-corruption/what-is-corrupt-conduct.

Strategic Position

Adverse Power Price Impact on NSW Consumers

One of the central responsibilities of government is to ensure essentials to life are available to citizens at the lowest true cost. In a modern society, electricity is one of those essentials upon which consumers depend innumerable times throughout every day, as do virtually all businesses. There is no more strategic economic responsibility for state governments than ensuring the availability of electricity to the people of their state at the lowest true cost of providing that electricity.

In the 7 years from March 2007 to March 2014, the electricity component of the Sydney CPI rose 121% compared to an overall CPI increase of 22%[2]. Since overall CPI also includes direct and indirect electricity costs, over those 7 years, electricity prices have risen 6 times faster than other consumer prices.

This increase has occurred under both Labor and LNP governments. During Labor's 4 years from March 2007 - March 2011, Sydney consumer electricity prices increased by 55%, while the Sydney CPI increased by 13%. During the first 3 years of the current LNP NSW government, Sydney electricity prices increased by 42% compared to an overall CPI increase of 8%.

Part of the more recent NSW increase in power prices is due to the Gillard Government's "carbon tax" (now abolished). However, all states were subject to that impost. Nationally this was associated with a step change increase of 12% from June to September 2012, though in Sydney the increase in that quarter was 18%. During the first 3 years of the current NSW government, while Sydney consumer electricity prices increased by 42%, the comparable increase across other Australian capital cities was only 33%.

So NSW electricity prices have risen faster in that period than for the rest of Australia. If the common effect of the "carbon tax" is excluded, then Sydney electricity prices under the current government have risen almost 50% faster than across other Australian capital cities.

During the period September 1980[3] to March 2007, Sydney electricity prices rose by 311% while the overall CPI for Sydney rose by 227%, ie over almost 27 years the electricity component increased faster than CPI but only 37% faster. This amounted to an average annual increase in electricity prices of 5.5%. Contrast that with the period since March 2007, when electricity prices have increased at about 12% pa.

It is no coincidence that this is the same period in which there has been a rapid increase in non-conventional[4] "renewable" electricity that the NSW population are forced to buy. A

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[2] *ABS 6401.0 Consumer Price Index, Australia, TABLE 11. CPI: Group, Sub-group and Expenditure Class, Index Numbers by Capital City*. All Sydney electricity and other price figures cited here are from that source.

[3] Earliest available breakout of electricity component of CPI for Sydney.

[4] "non conventional" includes wind and solar generated electricity. It excludes hydro power which has long been a conventional form of renewable energy that mankind has used for its economic merit without requiring subsidies or government coercion.

multi-period, multi-country study of the introduction of non-conventional renewable electricity in the EU has demonstrated that, within the almost 30 countries in the study:

> "each 1% increase in the share of non-conventional renewable in the provision of electricity adds between 1.7% and 3.2% to consumer electricity prices." [5]

It is evident from the massive rate of increase in NSW electricity prices that, compared to European countries, the NSW government has managed to achieve far worse consumer price increases from introducing "renewable" energy into the mix.

These price increases fall most heavily on lower income sections of the community. They reduce the standard of living of all NSW citizens except those gaining financial benefits from the forced use of wind and solar power, and they impose massive externalities on citizens whose residences are despoiled by the addition of wind farms in particular[6].

No doubt the proponent will cite computer models to claim that despite the real world evidence noted above, their wind farm will lower prices for consumers. When I started computer programming for the Department of Defence almost 50 years ago, the term GIGO (garbage in – garbage out) was common parlance. That has not changed.

Computer models are simply complex collections of interacting equations and conditions all based on assumptions. If the assumptions are wrong the results are wrong. If the equations and the way they interact are flawed, the results are wrong. The more complex the model, the greater the likelihood it will be flawed.

The models produced by "renewable energy" proponents in past years did not predict the electricity price increases that have occurred in NSW, the rest of Australia and the world as governments have mandated the use of this form of electricity production. Their failures to predict the real world outcomes demonstrate they are fundamentally flawed – unless the proponents believe the ABS and Eurostats have been rigging the numbers they report.

Unless the assessors of this proposal believe it is NSW Government policy to:

- *raise consumer electricity prices very much faster than by depending on conventional forms of electricity generation; and*
- *impose the greatest hardship from this policy on the lower income segments of the NSW population.*

then **the evidence cited here makes clear the Liverpool Range Wind Farm proposal must be rejected as contrary to NSW government policy**.

The converse implication applies. Should the assessors approve this proposal on behalf of the NSW government, it will be a clear statement that it is NSW government policy to:

- *raise consumer electricity prices very much faster than by depending on conventional forms of electricity generation; and*
- *impose the greatest hardship from this policy on the lower income segments of the NSW population.*

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[5] Dr Michael Crawford, *Australian Renewable Energy Policy: All Pain and No Gain,* 2014, Appendix A, RET Review submission, also included here.

[6] Ibid, p. 3.

Misleading Electricity Net Demand Forecast

On page 15 the Environmental Assessment (EA) cites AEMO's *Annual Electricity Statement of Opportunities* (2012) to claim that "AEMO has estimated that additional power generating capacity will be required to manage peak periods in NSW ***by summer 2018/19***." and this is offered as evidence of the need for the Liverpool Range Wind Farm.

It is telling that the EA is quoting a 2012 AEMO forecast when there are much more recent forecasts from AEMO, which somehow escaped the developer's attention. For instance, AEMO's *May Update: Supply–Demand Snapshot* published in June 2014 which is far less bullish about the need for additional electricity supply than indicated in the EA. This is confirmed in the most recent report published in August 2014.

AEMO explains that: "ESOO supply–demand modelling assesses the adequacy of existing and committed electricity supply to meet demand in the NEM [National Electricity Market] by identifying Low Reserve Condition (LRC) points. LRC points indicate when additional investment in generation or demand-side participation may be required to maintain electricity supply reliability within the NEM Reliability Standard"[7].

AEMO's 2013 *ESOO*, which the developer apparently failed to find, stated that under a medium growth scenario the LRC for NSW ***was beyond 2022-23*** and, for a high growth scenario it was in ***2021-22***[8]. AEMO's May 2014 update confirmed that forecast for NSW[9]. In addition, it also shows that actual electricity consumption in 2013-14 was below what was previously forecast. So the 2013 document put the need for additional electricity generation capacity ***at least 3, and perhaps 4 or more, years later*** than the developer claims.

The 2014 ESOO says that the earliest time NSW will face a supply shortage, even under a high demand scenario, is ***beyond*** 2023-24, ie at least 10 years in the future[10]. So the most recent document pushes the requirement even further into the future, saying the need for additional capacity is ***at least 5 years later*** than the developer claims.

From the above we can conclude two things:

- ***In terms of electricity supply requirements for NSW, the Liverpool Range Wind Farm is not required and there will not be an additional generation requirement for NSW until 2024 or beyond, so the proposal should be rejected.***
- ***In choosing to use a 2012 AEMO report instead of the most up to date information from the same agency, or even the 2013 ESOO, which are far less supportive of Epuron's case, the EA has apparently set out to mislead the Department of Planning.***

On page 83, the developer's proposal says:

> Electricity consumption continues to grow, and the additional demand must be met by either increased fossil fuel generation or an increase in generation from renewable sources such as wind power.

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[7] AEMO, *2013 Electricity Statement of Opportunities, Executive Summary*, p iii.
[8] Ibid, p. iii.
[9] AEMO, *May Update: Supply–Demand Snapshot*, June 2014, p. 3.
[10] AEMO, *2014 Electricity Statement of Opportunities, Executive Summary*, August 2014, Table 1.

However, if we turn to AEMO[11], we learn:

> The 10-year average annual growth rate for the 2014 NEFR medium scenario is 0.3%, which is lower than the 1.3% forecast in the 2013 NEFR. The 2014 NEFR high scenario forecasts are lower than the 2013 NEFR medium scenario forecasts.

and Figure 2 in that document shows that, contrary to the developer's statement, ***actual annual energy consumption peaked in 2009/10 and has been progressively declining since***. The reasons AEMO gives for this decline are:

- A decline in energy-intensive industries, including closure of the Point Henry aluminium smelter in Victoria.
- Strong growth (24% average annual) in rooftop PV installations, particularly in Queensland and Victoria.
- Strong growth (10% average annual) in total energy efficiency savings.

The developer failed to recognise what was happening in the electricity market and now wants the NSW government to ignore the objective information from AEMO and pretend that reality is what the developer needs it to be.

In reality, AEMO, the body that manages the electricity market for NSW and the eastern grid, has very explicitly stated there is no requirement for additional capacity for ***at least 10 years***. By that time the economics of alternative forms of "renewable" energy may be very different. In the meantime, bringing on additional capacity will simply mean extra capital and operating costs to be recouped from electricity consumers, as has been occurring since 2007.

The developer's proposal should be rejected as unnecessary to NSW electricity supply.

The developer should be publicly rebuked for trying to sway the evaluation with outdated and grossly misleading forecasts.

[11] AEMO, *2014 Electricity Statement of Opportunities,* August 2014, p. 9.

Consultation

Misuse of Irrelevant and Faulty Surveys

In its section on consultation, the developer's document opens by telling the DPE not about actual consultation in the project area but by quoting the grossly and widely misrepresented 2010 survey *Community Attitudes to Wind Farms in NSW* and claims[12]:

> "Based on the above independent surveys, it is reasonable to assume that the communities within the ACT/NSW Border Areas Precinct are generally supportive of wind farms"

In fact, that survey has multiple problems that make it totally unsuited to support the LRWF proposal. Appendix A examines them in detail. In summary:

- It was conducted at a time when there was very little real, local experience for respondents to draw on about the impact of wind farms.
- The wind turbines then operating in the regions covered were small and weak compared to those now being "justified" by this survey.
- Only about 20% of the people covered by the survey could reasonably be said to be subject to possible personal impact from wind farms, so the result is heavily skewed by those not so exposed.
- Perhaps not coincidentally, the "79% support for a wind farm being built 10 km from their residence" cited by the developer[13] is remarkably close to the proportion of the survey group that was at no risk of having that happen.
- The unbelievably large responses about seeing (81%) and hearing (35%) wind farms, at a time when there were almost none operating in the large region surveyed, indicates some fundamental problem in sample selection or survey conduct or respondent's understanding of the matter upon which they were being quizzed, which means the results cannot be relied upon.
- The survey included emotive, value-laden statements, which are normally avoided in objective surveys because they are known to skew answers.

And the kicker is the caveat included in the survey report[14]:

> "no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances."

Despite that disclaimer, not to mention the multiple defects noted above, the developer for LRWF trots out the survey to support their claim:

> "Based on the above independent surveys, it is reasonable to assume that the communities within the ***ACT/NSW Border Areas*** Precinct are generally supportive of wind farms"

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[12] EA, p. 112.

[13] EA, p. 112.

[14] *Community Attitudes to Wind Farms in NSW*, Department of Environment, Climate Change and Water NSW, 21 December 2010, p. 2.

suggesting that at this point they have forgotten they are writing a proposal for a wind farm in the Upper Hunter region and not somewhere near the ACT.

Had they taken the trouble to actually examine the survey they are mistakenly using to attempt to justify their proposal, they would discover that according to the survey report, within the Upper Hunter precinct there was:

> "Lower than average support for wind farms within 10 km (-5%) and 1-2 km (-10%)" [15]

So in order to claim local support for their proposal, they are using a survey which reported less support for wind farms in that area than in any of the other renewable energy precincts included in the survey.

It is patently obvious that the developer has no interest in the local community other than as an area to be exploited, otherwise they would know these things and not be referring to the ACT/NSW Border Areas Precinct when they mean the Upper Hunter.

The developer also attempts to impute local support by reference to the 2012 CSIRO report *Exploring Community Acceptance of Rural Wind Farms in Australia,* which is a breathtaking instance of research incompetence. Based on interviews with a minute sample of 27 people, half of whom had financial interests in wind farms, and one third of whom actually belonged to wind farm companies, the report concluded:

> "There is strong community support for the development of wind farms, including support from rural residents who do not seek media attention or political engagement to express their views." [16]

This conclusion was reached despite the report also including a newspaper coverage analysis that showed opposition to wind farms much greater than support, and a desk review of actual industrial wind farm projects that showed half of them had high opposition and 2/3 had high or moderate opposition.

No one with even a basic understanding of statistics honestly conducts a survey with a sample of 27 people, overwhelmingly weighted to favour a particular viewpoint, and then purports to generalise the views of those 27 people to a population of millions.

This astounding piece of intellectual incompetence is discussed in more detail in Appendix B.

The fact that the developer has trotted out the unsubstantiated headline conclusion from such a report to back up its claims of strong support in the region of its wind farm proposal, despite not having conducted a survey in that locality, shows it is truly scraping the bottom of the barrel to offer disinformation to the DPE.

This is hardly surprising given the developer's total disregard for the requirement for actual full and open consultation with residents in the Liverpool Range locality (not the ACT/NSW Border Region).

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[15] *Community Attitudes to Wind Farms in NSW*, Department of Environment, Climate Change and Water NSW, 21 December 2010, p. 56.

[16] Op cit, p. 9.

Appalling Consultation and Engagement Record

The Planning Department rebuked the developer for deficiencies in consultation and engagement[17] – which the department does not do lightly – and subsequently reinforced the need for this consultation and engagement.

In December 2011 the developer stated it would establish a Community Consultative Committee (CCC) and abide by the guidelines that would soon be issued by the Department of Planning. A CCC was not established until November 2012, almost one year later. The second meeting of the CCC was in June 2013, a further 7 months down the track.

And what was the composition of the CCC? At the second meeting there was Epuron's paid chairperson, 1 involved landholder, 2 Epuron representatives, members from 3 different councils (each of which has an interest in financial payments from the wind farm) and 2 uninvolved landowners. So there were 7 participants with some financial interest or relationship with the proposed wind farm and 2 unconflicted landowners.

Compare that with the requirements in the Draft Wind Farm Guidelines[18] which call for:

2 – 3 developer reps (financial interest)
1 council rep (financial interest)
1 independent chairperson (no financial relationship)
5 – 7 community reps (no financial relationship [19])

So, in terms of financial relationship with the wind farm, the guidelines anticipate a balance on the CCC of 3-4 financially associated versus 6-8 who are not. The LRWF blew this balance into oblivion, having 7 financially associated versus 2 not.

Thus, in no way has the LRWF CCC complied with the guidelines that, in December 2011, the developer said it would follow.

The Planning Minister has recently announced that the DPE will henceforth be appointing community representatives (and hopefully genuinely independent chairpersons) to all wind farm CCCs because of the chronic bad behaviour of developers in this matter. The LRWF is a glaring example of that behaviour.

In summary, the LRWF developer has failed to engage in any meaningful, open consultation with the broad local community, except perhaps those now with a financial association. Except for the latter group, it has been mock consultation and even that has been incredibly limited.

It has not engaged in local, independent, polling to establish actual opinions in the community. Instead it has tried to rely on more general surveys which are seriously flawed

[17] Supplementary Director-General's Requirement for Liverpool Range Wind Farm MP10_025, dated 16/8/2011; and Proposed Liverpool Range Wind Farm (MP 10_02251 - Supplement to the Director-General's Requirements, dated 25/3/2014.

[18] Draft NSW Planning Guidelines Wind Farms, December 2011, Appendix C.

[19] The guidelines specify that there should be 2 uninvolved landowners living within 2 kms of the wind farm and that all community representatives must be able to engage in full and open discussion with other residents about the wind farm – which hosts cannot do because of gag clauses in their contracts.

and failed to notice that one of them explicitly identified relatively low support for wind farms in the Upper Hunter precinct where this wind farm is to be located.

Government Enforcement of Community Consultation and Engagement

Either the government's requirement for full, open consultation with affected communities is a potential show-stopper for developers or it is a sham. If developments are able to proceed despite breaching this requirement in every way, then there is no requirement and just a dishonest fig leaf waved in front of local communities by a government bent on helping developers do whatever they want.

If the consultation requirement is meant to be real, then the DPE has no alternative but to:

- **reject all purported claims of appropriate consultation by the proponent;**
- **reject the EA and tell the developer to come back when it can demonstrate a lengthy period of real consultation with the broad community in the area and particularly those who are potentially directly affected in various ways.**

Should the DPE/PAC accept this EA, it will demonstrate to everyone that there is no real consultation requirement and the claimed provision is a sham perpetrated by the DPE and its ministers in order to provide approvals partial to developers. It will also demonstrate that officials in the department are allowed to act contrary to the wind farm guidelines and contrary to the department's own published charter.

Landscape and Visual Impact Assessment

Visual Pollution

The LVIA provided with this proposal conflates two different but related aspects of concern about visual pollution, ie

- the public interest in the landscape and its visual character;
- the private interest of residents whose properties are directly, adversely affected by visual pollution from the development.

Both of these need to be explicitly and appropriately dealt with. The means for so doing may differ.

Local residents near any wind farm development have a twofold interest as:

- they have a very clear interest in the extent of visual pollution that impinges on their property; and
- they participate in the public interest in the extent of visual pollution affecting the locality within which they live and which may affect them as they go about their affairs off their property.

Wind farm visual pollution within a locality impacts on residents in two main ways. The first is their immediate sensory experience and personal reaction to it. The second is the important economic signal it gives to everyone.

The existence of a wind farm says to everyone "The authorities are willing to see wind farms established in this broad area. There is thus a material likelihood they will allow existing ones to expand and more to be added. So it is a high risk area for investment if you want to live with an unpolluted life style." That signal inevitably affects property values in a wide area not confined to properties with direct line of sight to an existing or currently proposed wind farm.

The private interest aspect of dealing with the visual pollution from a wind farm can be handled through market mechanisms, such as the developer paying for a visual easement over properties, so long as the requirement for this and the price are not determined by the judgement of someone who does not care for the particular local landscape, and certainly not based on the judgement of someone paid by the developer.

The public interest aspect is different inasmuch as there is no single party or group with whom the developer could negotiate a commercial arrangement. So in that case it falls to government agencies to decide what is acceptable. The LVIA is the step typically used in so doing. However, as in this case, it generally depends on the judgement of ***the developer's chosen consultant, who is always likely to be a biased assessor of the extent of the visual impact of a wind farm on the local landscape***.

There are two reasons for this:

- the revealed preference inherent in where people live; and

- the bias that research has revealed in the landscape judgements of people who favour renewable energy and wind farms as part of that.

Revealed Preference

Subject to financial considerations and the dictates of access to things like jobs, transport, family and schools, most of us tend to live where we prefer. Consequently we are more likely to have a preference for the visual environment around where we live than do people who have chosen to live elsewhere. This is ***revealed preference***, long recognised in economic analysis [20].

So when it comes to judging the value of views and landscape around rural properties threatened by visual pollution from a wind farm or other industrial development, those who have chosen to live there will almost invariably value those views and landscape more than someone else who has chosen to live elsewhere, ie who has a different revealed preference. And normally people chosen to conduct an LVIA fall into the latter category.

It is no fault of those chosen for this task, and no malice is implied. They simply have different subjective visual preferences to those of people living in a potentially affected area and consequently will tend to underestimate the adverse impact on residents due to the intrusion of wind turbines. In LVIAs like this, the authors make judgements as though their preferences are not subjective and not inherently biased, and convey the impression that evaluations they give are neutral when they are not.

Pro Wind Farm Bias

Research has demonstrated that "The addition of wind turbines was almost universally perceived as a negative impact on the landscape scene"[21] and that "Similarly to Johansson and Laike[22], the only characteristic of the respondents that significantly influenced their preferences for wind turbines in our study was their attitude towards wind power."[23]

The LVIA acknowledges that "People's perception of wind farms is an important issue to consider as the attitude or opinion of individual people adds significant weight to the level of potential visual impact."[24] However, this does not support the position the LVIA tries to advocate.

Molnarova and colleagues showed that ***people who are pro wind energy consider the impact of wind turbines on a landscape as less negative than do people who are tolerant of wind power or simply indifferent to it*** (my emphasis), and that these differences in perception are substantial and highly statistically significant. They also found ***this is the case irrespective of***

[20] The concept of revealed preference has long been known to economics and widely used in economic analysis, going back at least to articles by Paul Samuelson, one of the pre-eminent economists of the twentieth century: Samuelson, P., "A note on the pure theory of consumer behaviour", *Economica*, 1938, 5:61-71; Samuelson, P., "Consumption theory in terms of revealed preference", *Economica*, 1948, 15:243-253.

[21] Molnarova K., Sklenicka P., Stiborek J., Svobodova K., Salek M., and E. Brabec, "Visual Preferences for Wind Turbines: location, numbers and respondent characteristics", *Applied Energy* 92 (2012): 269-278, p. 19.

[22] Johansson, M. and Laike, T. "Intentions to respond to local wind turbines: the role of attitudes and visual perception", *Wind Energy* 2007: 10:435-451.

[23] Molnarova, et al, p. 17.

[24] LVIA, p. 104.

whether the rater is what might be called a landscape expert or anyone else, and irrespective of whether they live with wind turbines in their locality or not [25].

Thus while someone who is pro wind power is still likely to see some negative effect from wind turbines on a rural landscape, they will tend to rate that impact as being a lot weaker than the rest of the community, including the large part of the community that has no firm views one way or the other about wind power.

Given that "GBD has been commissioned for over 20 wind energy projects across New South Wales, Victoria, South Australia, Queensland and Tasmania" [26], it is reasonable to assume it and the author of the LVIA are pro wind power, which has given them so much employment. As we will see later, advocacy in the LVIA (as opposed to assessment) also indicates the author is pro wind power. If it is claimed otherwise, then it is incumbent on the author to actually demonstrate that not to be the case.

It is not sufficient to simply claim that the author is "professional", since Molnarova and colleagues have demonstrated that "experts" who are pro wind are as inclined to this bias as anyone else.

Why Do These Biases Matter?

The document tries to convey a quantified, structural approach in assessing the visual impact on residents and others. It presents various categorisation structures for assessing landscape sensitivity[27], view location sensitivity[28], number of viewers[29], sensitivity and magnitude assessment criteria[30], distance effect[31], and a visual significance matrix[32], all of which, incidentally, are generally presented without any objective basis being cited to support them.

But after all that, it tells us in fine print, that "***The descriptions of magnitude and sensitivity are illustrative only. Each case is assessed on its own merits using professional judgement and experience*** (my emphasis)"[33].

So ultimately, according to the report, all the assessments of impact, both in terms of the broad landscape and the effect on individual residents, are a matter of the author's judgement. And, as has been described above, that judgement is unavoidably biased.

[25] Molnarova, et al, Figure 6, p. 15.
[26] LVIA, p. 2.
[27] LVIA, pp. 36 – 44.
[28] LVIA, p. 53.
[29] LVIA, p. 54.
[30] LVIA, p. 54.
[31] LVIA, p. 51.
[32] LVIA, p. 56.
[33] LVIA, p. 56.

What Should Be Done?

It is impossible to obtain raters who are unbiased. What the DPE/PAC need to see are evaluations from multiple perspectives. Everywhere the LVIA presents an assessment of impact, that assessment needs to be done by a panel (say 3 - 5 people), with individual estimates of impact reported. The panel needs to include locals (at least 2) who are not aligned with the wind farm proposal and the DPE needs a process of assurance that the panellists have not been selected as having views helpful to the developer and that they have not been subject to influence before or after selection.

The DPE should require that the LVIA be redone using an assessment panel that fairly involves non-aligned locals, transparently chosen.

This follows since the DPE/PAC cannot simply rely on the LVIA as tendered, given the unavoidable biases noted above, and it cannot give approval to the proposal without appropriate LVIA input.

Fair Treatment of Private Interests Against Visual Pollution

As earlier noted, there is a difference between the public interest aspect and the private interest one. The government has to make a decision on the first. It should not be making decisions on the second except to the extent of ensuring mechanisms such that the developer is required to reach reasonable commercial arrangements with all parties that may be materially affected by visual or other pollution from the development – as the developer has already done for its own benefit with a number of property owners.

The simplest arrangement is to require that within a certain distance of the wind farm (discussed below) the developer must acquire a visual easement over each property. In the event it is unable to reach agreement with the owner, it must offer to acquire the property at a price (determined in an arm's length manner) that would have been its value without the wind farm, plus transaction costs. This arrangement would prevent residents from holding the wind farm to ransom since, if their demands were excessive, they would have to either be bought out, which most won't want, or accept the wind farm's offer for the visual easement, or get nothing.

The remaining question is "what distance?". As discussed later, the LVIA has used a zone of visual influence (ZVI) of 10 kms, whereas the best practice advice from Scottish Natural Heritage (SNH) for turbines of the proposed height is a ZVI of 45 kms. The latter distance is certainly too far for requiring visual easements, and SNH did not suggest it for that purpose, but it demonstrates the potential distance of visual impact.

Research and evaluative work linking turbine height to visual impact[34] suggests that turbines of the height proposed, especially en masse, will have a major visual impact due to proximity

[34] See Campaign for the Protection of Wales, The "Sinclair-Thomas Matrix" in *Evidence to the House of Lords European Communities Committee, Sub-Committee B-Energy and Transport. Appendix 1: The Potential Visual Impact of Wind Turbines in Relation to Distance*, 1999.; also *Visual Assessment of Windfarms: Best Practice*, Commissioned Report F01AA303A for Scottish Natural Heritage by University of Newcastle, 2002; Robert G Sullivan, et al, "Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes, Argonne National Laboratory, University of Chicago, 2012; Robert G Sullivan, et al, "Offshore Wind Turbine Visibility and Visual Impact Threshold Distances", *Environmental Practice*, 1-17.

and be capable of dominating the landscape out to at least 10 kms, which coincides with the minimalist ZVI used in this LVIA.

The developer should be required to acquire visual easements from all non-associated property owners within 10 kms of the wind farm or, alternatively, offer to acquire the properties at a genuine, independent third-party determined, unimpaired value plus transaction costs.

This may lead to the developer acquiring a few additional properties which it can then either lease or onsell. There will be no loss to it in those cases except the transaction costs and the implicit value of the visual easement, which it should be paying in any case.

The price for a visual easement would tend to decline with distance from the wind farm. So it is more appropriate to err on the side of protecting residents than advantaging the developer at their expense. That is consistent with the precautionary approach espoused in the NSW Planning Guidelines for Wind Farms. Reaching agreement with a broad range of neighbours would no doubt improve local acceptance of the wind farm.

Applying an Appropriate Zone of Visual Influence (ZVI)

The LVIA report cites the 2006 document *Visual representation of windfarms: good practice guidance*[35] released by Scottish Natural Heritage, which in large part is based on the extensive research report *Visual Assessment of Windfarms: Best Practice*[36] (also cited in the LVIA). That document contains a height-related table for the appropriate Zone of Visual Influence (ZVI or ZTV (Zone of Theoretical Visibility)) to use in evaluating visual impacts of wind farms on the surroundings. For turbines with a tip height of 130 metres or more, the appropriate ZVI is given as 35 kilometres[37]. The LRWF wind turbines are 165 metres to tip height, so well above the height at which the SNH advice called for a 35 kilometres ZVI.

In fact, Scottish Natural Heritage has, this year, released an updated version of its best practice guidelines[38]. The latest document allows for the increasing height of wind turbines and its table of recommended height-related ZVI distances includes a ZVI of 45 kms for turbines (including rotors) of 150+ metres. So ***best practice ZVI for turbines as high as those at the proposed LRWF is 45 kms***.

Yet the LVIA for this proposal has used a ZVI of only 10 kilometres, ie less than one quarter the distance recommended by Scottish Natural Heritage. Clearly using the ZVI recommended as best practice by Scottish National Heritage would identify a large number of additional properties for which the visual impact of the LRWF needs to be assessed. There appears to be no explanation offered in the document for stinting on the application of best practice. (**Note**. The EARs say ***at least*** 10 kms.) Obviously following best practice would cost the developer more, so it appears the developer has saved some money by excluding potentially a large number of people from a proper assessment of the visual impact of LRWF on them and their properties, and likewise limiting the public interest assessment.

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[35] *Visual representation of windfarms: good practice guidance*, Scottish National Heritage, Report FO3 AA 308/2, 2006.

[36] *Visual Assessment of Windfarms: Best Practice*, Commissioned Report F01AA303A for Scottish Natural Heritage by University of Newcastle, 2002.

[37] *Visual representation of windfarms: good practice guidance*, Scottish National Heritage, 2006, p. 36.

[38] *Visual Representation of Wind Farms, Version 2*, Scottish Natural Heritage, July 2014.

The developer should be required to complete an LVIA that complies with best practice using a ZVI of at least 45 kilometres, as recommended in *Visual Representation of Wind Farms* by Scottish Natural Heritage.

LVIA Admission of Significant Harm to Local Residents

The LVIA effectively admits there will be serious harm to the landscape and views due to the LRWF, and thus to residents. It does so by quoting the judgement of Justice Preston in approving the construction of a wind farm at Taralga.

> "Resolving this conundrum – the conflict between the geographically narrower concerns of the guardians and the broader public good of increasing the supply of renewable energy – has not been easy. However, I have concluded that, on balance, the broader public good must prevail." [39]

The LVIA goes on to say "Similar reasoning can be applied to the Project"[40], thereby admitting there will be serious harm to local residents. However, the decision by Justice Preston was made weighing up the balance in a particular case. It was not a blanket authorisation that wind farm interests should prevail over local interests irrespective of the balance between the two, which always depends on the specific situation. The LVIA offers zero evidence to show the balance of benefit and harm in this case matches that at Taralga, which is less than a quarter the size of this proposal.

In launching into this piece of advocacy for LRWF, the author clearly demonstrates their pro wind power disposition which, the research by Molnarova, *et al* shows, leads to a high likelihood of the person underestimating the adverse effect of wind turbines on the landscape and views.

In trying to bolster the case for the LRWF (ie advocacy not objective assessment of landscape and visual impact), the LVIA cites the 2010 survey[41] conducted by AMR Interactive for the NSW Department of Environment, Climate Change and Water. The multiple deficiencies of that survey have been explained in the section of this critique dealing with the developer's comments about consultation and in Appendix A.

In addition, the LVIA author fails to mention the very explicit caveat given by AMR Interactive[42]:

> "This report was prepared by AMR Interactive in good faith exercising all due care and attention, but no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect of, their situation."

and fails to in any way show why that caveat does not apply here, or any reason why that survey is pertinent to the specific LRWF situation, thus totally ignoring the guidance provided by AMR Interactive.

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[39] LVIA, p. 107.
[40] LVIA, p. 107.
[41] *Community Attitudes to Wind Farms in NSW*, Department of Environment, Climate Change and Water NSW, 21 December 2010.
[42] *Community Attitudes to Wind Farms in NSW*, Department of Environment, Climate Change and Water NSW, 21 December 2010, p. 2.

The LVIA then goes on to approvingly cite a number of other surveys of uncertain validity and fails to in any way establish their validity in this case, or caveats that may have been put on their use by the parties who conducted them.

We do know, however, that all of these surveys were conducted in 2002 and 2003 when extant wind turbines were far smaller than those proposed for LRWF and almost certainly the wind farms had far fewer turbines than proposed for LRWF.

It is simply not possible to generalise from public attitudes to wind farms expressed in surveys more than a decade ago, to LRWF, which is a very different class of wind farm.

The fact that all of these weaknesses in the "evidence" cited were either missed or ignored by the author reinforces the conclusion that the LVIA is an advocacy document by a pro wind power (and consequently, likely biased) partisan rather than an objective assessment.

It follows that the DPE/PAC needs to recognise the LVIA is not an objective document, as it stands, and exclude it from consideration.

Need for Reliability of Advice

The LVIA includes this caveat at the end:

> "GBD has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Epuron Australia Pty Ltd and only those third parties who have been authorised in writing by GBD to rely on the report." [43]

Has the DPE and all potentially affected residents been authorised in writing to rely on the report provided by Green Bean Design? If not, how can it be tendered by the developer as having any weight for consideration in supporting its application?

If either the DPE/PAC or affected residents are unable to rely on this document, then the DPE needs to require the developer to present a LVIA that the consultant stands fully behind for all parties. Until that is done, the developer must be regarded as having yet to provide an LVIA.

Residents need to be in a position to sue a relevant party if the DPE/PAC, relying on the advice of third parties, makes decisions unintentionally injurious to those residents. If third parties are able to absolve themselves from responsibility for the advice tendered then, were the DPE/PAC to nonetheless rely on that advice to support the developer's application, the DPE/PAC would be acting in a partial manner beneficial to the developer, which is corrupt conduct under the ICAC Act.

Summary

Despite a lot of discussion about various structures used in assessing landscape and visual impact, the LVIA explicitly admits that ultimately the assessment of visual impact is dependent on the subjective assessment of the author. So the matter of how biased the author's perceptions may be is critically important.

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[43] *Liverpool Range Wind Farm: Landscape & Visual Impact Assessment*, Green Bean Design, March 2014, p. 120.

Revealed preference indicates it is highly likely the author will underestimate the adverse visual impact on residents due to the LRWF. In addition, there is strong research evidence that people who are pro wind power underestimate adverse visual effects of wind turbines ***compared to the broad community***, and that this is true of "experts" as much as non-experts. The wind farm work history of Green Bean Design provides a *prima facie* case that the author is pro wind and that is reinforced by the sections of the LVIA that are quite explicitly wind farm advocacy rather than simply purporting to provide an assessment of the landscape and visual impact.

Consequently, **the DPE should require that the LVIA be redone using an assessment panel of 3-5 assessors that fairly involves non-aligned locals, transparently chosen, and with all the assessments being reported to the DPE.**

The LVIA has used a zone of visual influence (ZVI) far smaller than now described as best practice by a well regarded body with a long history of care for the landscape and national heritage. No reason has been offered in the LVIA for departing from best practice nor has the DPE explicitly condoned such a step.

The developer should be required to complete an LVIA that complies with best practice using a ZVI of at least 45 kilometres, as recommended in *Visual Representation of Wind Farms* by Scottish Natural Heritage.

The LVIA has failed to distinguish and adequately address the difference between harm from visual pollution to public interests and private interests. Consequently if has failed to deal with the latter appropriately.

For the reasons outlined above, **the developer should be required to acquire visual easements from all non-associated property owners within 10 kms of the wind farm or, alternatively, offer to acquire the properties at a genuine, independent third-party determined, unimpaired value plus transaction costs.**

Finally, the consultant for the LVIA has included a caveat that suggests its advice cannot be relied upon. That needs to be clarified and resolved, specifically **if either the DPE/PAC or affected residents are unable to rely on this document, then the DPE needs to require the developer to present an LVIA that the consultant stands fully behind for all parties. Until that is done, the developer must be regarded as having yet to provide an LVIA.**

Health

NSW Government Recognition of Industrial Noise Harm

The EIS attempts to convey the sense that adverse health and sleep effects due to noise are not really a problem, and may indeed be psychological (which would still be a problem).

It appears the developer is unacquainted with the NSW Industrial Noise Policy (INP), whose very first paragraph says:

> "The adverse effects of noise on communities are well reported in the literature (for review see Berglund & Lindvall, eds, 1995). These vary from direct effects (including noise-induced hearing loss, speech interference, sleep disturbance and annoyance), to indirect or secondary effects, such as long-term effects on physical and mental health as a result of long-term annoyance and prolonged disturbance to sleep. The World Health Organization defines health as a state of complete physical, mental, and social well-being, not just as the absence of disease (WHO 1947)." [44]

So the NSW Government has long been aware that industrial noise, which includes noise from wind turbines, can cause sleep deprivation, other functional disruption (such as speech interference) and other health damage. Somehow the developer missed this.

Given the NSW Government's INP, the only question is under what circumstances does wind farm noise harm sleep and health. No doubt the department will receive other more focused submissions on this point.

The DPE/PAC will find an extensive list of relevant evidence cited by the Waubra Foundation at http://waubrafoundation.org.au. That evidence relates to both audible and non audible (infrasound and low frequency sound) sound.

Judicial Recognition of Harm From Wind Turbines

In Ontario in July 2011, the Environment Review Tribunal found that: [45]

> "This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents"

In Victoria, the VCAT Tribunal members stated the following in April 2013: [46]

> "116 There is evidence before the Tribunal that a number of people living close to wind farms suffer deleterious health effects. The evidence is both direct and anecdotal. There is a uniformity of description of these effects across a number of wind farms, both in south east Australia and North America. Residents complain of suffering sleep disturbance, feelings of

[44] *NSW Industrial Noise Policy*, January 2000, p. 1.
[45] http://waubrafoundation.org.au/resources/judgement-erikson-v-min-environment-suncor-kent-breeze-case/
[46] http://waubrafoundation.org.au/resources/vcat-cherry-tree-wind-farm-hearing-orders/

> anxiety upon awakening, headaches, pressure at the base of the neck and in the head and ears, nausea and loss of balance.
>
> 117 In some cases the impacts have been of such gravity that residents have been forced to abandon their homes.
>
> 118 On the basis of this evidence it is clear that some residents who live in close proximity to a wind farm experience the symptoms described, and that the experience is not simply imagined."

In Falmouth USA, also in November 2013, a superior court issued an immediate injunction to stop the operation of two wind turbines to prevent "irreparable harm to physical and psychological health". The turbines were ordered to cease operating between 7pm and 7am, and on Sundays and specified public holidays. [47]

In Portugal, a superior court ordered four turbines to cease operating day and night and that the turbines should be removed because of adverse health effects which were reported both day and night. Sleep deprivation was explicitly mentioned. The English translation of the relevant section of the original judgment is below: [48]

> "The right to rest, tranquillity and sleep are aspects of the right to humane treatment (Article 25, para. 1 of the Constitution of the Republic of Portugal), which is part of established fundamental rights, the collection of rights, freedoms, and guarantees. These personality rights are well protected against any unlawful interference, not necessarily in blame for an offense in intent to harm the victim, but in the offense itself."

The evidence that wind farm noise ***can*** cause health problems is indisputable, and is of course recognised in the NSW Government's Industrial Noise Policy. That has not caused wind farm protagonists to stop trying to deny reality. They have, for instance, sought to exclude from consideration any scientific evidence that does not directly involve wind farms in the field, which for obvious practical reasons has been more difficult to organise than laboratory research on similar sounds.

The effort to suppress this related evidence is like attempting to exclude broad scientific knowledge about the carcinogenic effects of ultra violet light from an assessment of the likely effect of exposure to sunbed emissions.

Sleep Deprivation

The obligation of DPE/PAC members is further strengthened by the fact that Australia is a signatory to the *UN Convention Against Torture*.[49] Sleep deprivation is a common consequence of wind farm noise, which the NHMRC recently recognised is present in the

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47 http://waubrafoundation.org.au/resources/falmouth-mass-judge-muse-decision-shut-down-wind-turbines-causing-irreparable-harm/

48 http://waubrafoundation.org.au/2014/portugese-supreme-court-orders-four-wind-turbines-removed/

49 https://www.humanrights.gov.au/convention-against-torture-and-other-cruel-inhuman-or-degrading-treatment-or-punishment-human-rights

existing limited wind farm specific research literature, along with "annoyance" symptoms and poorer quality of life.[50]

Sleep deprivation is explicitly acknowledged as a form of torture by both the *UN Committee against Torture*,[51] and the *Physicians for Human Rights*.[52] Anyone who has followed the ongoing US debate about torture by the US Government will have noted that sleep deprivation is one of the techniques regularly reported as used to break the resistance of subjects.

Should the DPE/PAC not build in strong mechanisms to protect residents from sleep deprivation and other adverse health effects, the members deciding on this application will be explicitly authorising torture despite clear warning that is the consequence of such actions.

Distance of Adverse Impact on Residents

Once it is recognised wind farm noise can cause sleep deprivation and other harm to health, the key question is "at what distance and under what circumstances?" Australian experience provides some answers.

Marshall Day Acoustics in their report for Ratch re the Mt Emerald wind development have recently referred to 10km in the context of cumulative impacts from other wind developments, and they are now specifically referencing infrasound and low frequency noise. In section 5.6 they stated in their section "review of cumulative impact":

> "Separate wind farm developments that are in close proximity to each other have the potential to impact on the same receiver. It is therefore necessary to assess any potential cumulative noise impact on receivers, where such circumstances exist. We understand that there are no other wind farm developments currently planned or operating within 10km of the proposed MEWF. On this basis, cumulative impacts of noise from more than one operating wind farm are not considered further." [53]

A team from the University of Adelaide School of Mechanical Engineering, lead by Professor Colin Hansen, recently conducted extensive monitoring of nighttime (midnight – 5am) noise in and around a number of dwellings in the vicinity of the Waterloo wind farm. The observations were conducted over about 2 months with 8 dwelling in various directions around the wind farm. Noise at each dwelling was monitored for about one week[54].

They discovered that:

- ***About half the residences had multiple breaches of various guidelines (SA EPA, UK and Danish) during the period for which they were monitored***. Not every

[50] http://waubrafoundation.org.au/wp-content/uploads/2014/04/Systematic-review-of-the-human-health-effects-of-wind-farms-December-20131.pdf

[51] http://waubrafoundation.org.au/resources/un-convention-against-torture/

[52] *"Leave No Marks"* by Physicians for Human Rights, pp 22-26 http://physiciansforhumanrights.org/library/reports/leave-no-marks-report-2007.html

[53] http://mtemeraldwindfarm.com.au/updates/mewf_eis_docs/R72894%20EIS%20MEWF%20Volume%203%20-%20Appendix%207%20-%20Mt%20Emerald%20Wind%20Farm%20-%20Noise%20Impact%

[54] Hansen, K., Zajamsek, B. and Hansen, C., "Noise Monitoring in the Vicinity of the Waterloo Wind Farm", May 26, 2014.

observation was in breach but the number was substantial, which is important given it was night.

- ***Breaches were observed at a residence 8.7kms from the nearest turbine***, while some closer ones did not register breaches when they were monitored. Thus ***the absence of breaches at a residence near to a wind farm is no guarantee they won't be occurring at one further away***, since wind direction and other factors affect the extent of noise pollution at any point.

DPE/PAC Responsibility to Prevent Sleep Deprivation Torture of Residents

As noted earlier, sleep deprivation is endemic around wind farms – and will be around the LRWF unless powerful operating constraints are applied, of the sort recommended below.

The UN *Convention Against Torture and Cruel, Inhuman or Degrading Treatment* makes it clear there is no justification for torture, ever, and specifies criminal charges for those public officials who allow torture to occur, or to continue. The *UN Committee against Torture* explicitly recognises sleep deprivation as torture: [55]

> "The Committee against Torture (**CAT**) has noted that sleep deprivation used for prolonged periods constitutes a breach of the **CAT**, and is primarily used to break down the will of the detainee. Sleep deprivation can cause impaired memory and cognitive functioning, decreased short term memory, speech impairment, hallucinations, psychosis, lowered immunity, headaches, high blood pressure, cardiovascular disease, stress, anxiety and depression."

Given Australia is a signatory to the UN convention against torture, officials deciding on this application in relation to the LRWF and its operating conditions are legally bound to ensure those conditions do not result in torture for local residents, through sleep deprivation.

There is a tendency in decisions about wind farms to assert that while they clearly harm some private interests, "on balance" that is outweighed by some claimed public interest. Officials deciding on this matter should note that the UN convention does not set some number of people at which torture becomes acceptable or unacceptable, nor some presumed public interest for which it is allowed. If a single person is being subjected to torture, that is a breach of the convention.

The DPE/PAC is not in a position to judge whether the future operation of the LRWF will, or will not, cause recurrent sleep deprivation and adverse health effects to residents. That will depend on how the wind farm is operated, given the siting and equipment decisions. The DPE/PAC is, however, in a position to recognise that recurrent sleep deprivation and adverse health effects for residents is a genuine possibility.

Consequently, the DPE/PAC has an obligation to establish operating conditions and controls that will ensure recurrent sleep deprivation and adverse health effects for residents are not allowed to happen in practice.

The following section on noise discusses how that should be done.

[55] http://waubrafoundation.org.au/resources/un-convention-against-torture/

Noise

Failed Noise Predictions

The EA includes an extensive noise analysis by SLR Consulting Australia Pty Ltd which, after causing any reader's eyes to glaze over, essentially says "no problem".

The DPE/PAC need to step back and consider the track record of such analyses for wind farm proposals throughout Australia and overseas. It is a track record of almost uniform failure in predicting problems, and perhaps a track record of brilliant success in gaining approval for industrial sites that blight their neighbourhood.

If the department is not already aware from the complaints it receives from neighbours of wind farms, a little research will show that virtually every wind farm developed in Australia and most substantial onshore wind farms overseas ultimately end up with neighbours complaining bitterly about noise disruption and often about quite serious health problems due to sound emissions from the wind farm.

This is despite the fact that in virtually every case there has been a prior noise analysis that concluded "no problem" and was accepted as valid by the approving authority.

So the track record is of failed analyses by consulting firms submitting such reports as part of wind farm EAs. The department and the PAC cannot hide from that reality.

Given the clear warning provided by history, should officers of the DPE/PAC not build in an effective, reliable mechanism for noise control, they will make themselves personally culpable in the event of subsequent actions mounted by those adversely affected by a decision to wilfully ignore overwhelming evidence.

In this context, it should be noted that the noise impact assessment report from SLR Consulting bears the caveat:

> "This report is for the exclusive use of Epuron Pty Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR Consulting."

Does the department have written consent from SLR Consulting to rely upon this report? Equally important, has SLR Consulting given blanket coverage to neighbours of the proposed wind farm to rely on its findings?

Unless both the approving authority and residents have the right to rely on that report, residents injured by decisions made in good faith by the approving authority will likely be denied the right of legal action in relation to the party whose erroneous advice was the basis for the harmful decision. Approving the application under those circumstances would clearly constitute an "improper exercise of an official function in a partial manner" and be corrupt conduct under the ICAC Act.

Thus, unless SLR has given written authority for both the DPE/PAC and all neighbours of the LRWF to rely on SLR's advice, the report should be rejected and the developer required to

produce a noise assessment report from a consultant fully prepared to stand behind their advice tendered to the DPE/PAC in support of the developer's application.

Inability to Rely on Developer/Operator for Noise Compliance

Noise is, as the NSW Government's INP clearly states, a threat to sleep and health. In addition, history now shows a growing record of wind farm noise assessments that have proved inadequate in practice. It is also the generally recognised case that polluters pollute as long as they can get away with it.

Further, as laid out in the later section of this critique, *Inability to Rely on Developer*, this developer, in this EA and preceding it, has proved unreliable in complying with the department's requirements, in dealing with facts, and in showing real regard for the local community.

The developer also has an extensive history of onselling wind farms, as it did selling the Gullen Range project to Goldwind. So the behaviour of such buyers is also pertinent. The sorry saga at Gullen Range has recently been revealed at the PAC, after Goldwind ignored the ruling of the Land & Environment Court, ignored the complaints of residents on multiple matters, and ignored the department's tepid efforts to rein it in. Goldwind's actions included mis-siting an astounding 69 out of 73 turbines. The department proved incompetent and complicit in the developer's non-compliance with consent conditions – leading to widespread and ongoing calls for a judicial enquiry.

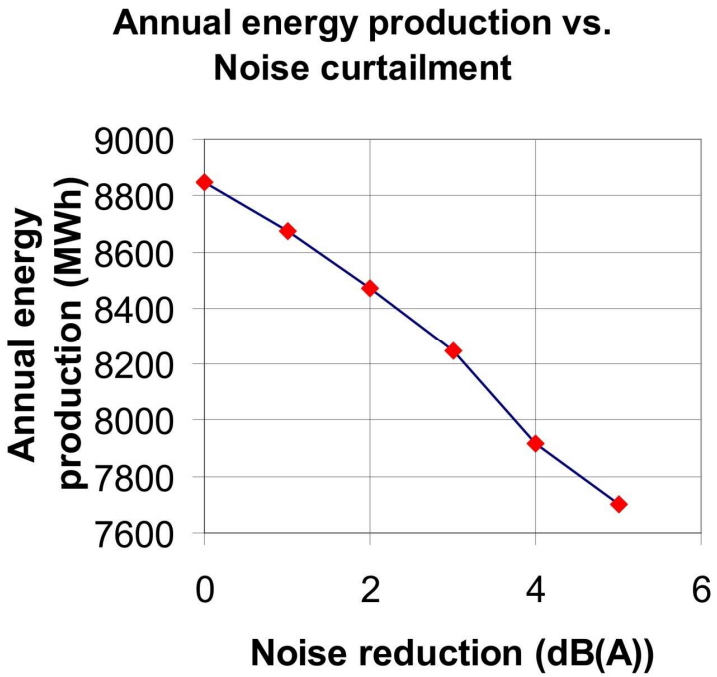
The EA refers to adjusting "blade angles to maximise power output and minimise blade noise"[56]. Yet a 2012 report from Siemens, the large German industrial firm and wind turbine manufacturer, referring to "smart controls" stated

> "1 dB noise reduction costs 2 - 4% annual energy production" [57]

and offered the following graph to illustrate the tradeoff between noise reduction and electricity production. As can be seen, the graph indicates a 5dB(A) reduction in noise is likely to entail about a 12% reduction in power output.

[56] EA, p. 37.

[57] "Low-noise wind turbine design", Stefan Oerlemans and Peter Fuglsang, Siemens Wind Power A/S, Presentation to EWEA Noise Workshop, Oxford, 2012.



Source: "Low-noise wind turbine design", Stefan Oerlemans and Peter Fuglsang, Siemens Wind Power A/S, Presentation to EWEA Noise Workshop, Oxford, 2012, p. 16.

So is Epuron, or whoever they sell the wind farm to, going to be maximising power or minimising noise, given the Siemens evidence that they can't be done simultaneously? And why would they suggest to the DPE/PAC that they would be doing both? The simple fact is that the DPE/PAC cannot rely on any undertakings by the developer or on forecasts by the noise modeller.

Consequently, it is incumbent on the DPE/PAC to ensure that if the LRWF development is approved it is subject to mechanisms that detect all breaches of noise conditions established for the facility and that such events attract quick penalties sufficient to ensure compliance.

Mandatory Genuinely Reliable Noise Compliance Mechanism

This requires permanent noise monitoring facilities, established around the wind farm, and not in any way under the control or influence of the wind farm or, indeed, dependent on government agencies that have a history of being inept or complicit in allowing breaches. Those facilities and their operation should be paid for by the developer.

Twelve, suitable, automated monitoring facilities can be established for less than $500,000, perhaps much less. Given that the EA tells us capital expenditure on the development will be $1,272 million[58], the cost of establishing reliable noise monitoring would be less than 0.04% of total capex. Operating the facility over 3 or 4 years might be a similar amount, which would be minute relative to the expected revenue from the development.

Such a facility would not only allow detection of breaches but offer real time feedback to the operator so it could take quick action to stop breaches. Appendix C contains more details about the how this facility should be established, structured and managed.

[58] Liverpool Range EA, p. 80.

Should the wind farm be approved, consent conditions should:

- **Impose noise conditions that, if met, will reliably protect residents from recurrent sleep deprivation; and**
- **Require the wind farm developer/operator to fund:**
    - **The facilities needed to provide permanent, full-spectrum, sound monitoring around the wind farm at 12 points suitable to detect any breaches of the noise conditions.**
    - **The ongoing operation of those facilities, including relevant professional data analysis and interpretation for rapid detection of breaches.**
- **State that:**
    - **The facilities are to be under the joint control of the NSW Environment Protection Authority (EPA) and a non-profit corporation (here called NoiseCo) whose members are local residents with no commercial or other affiliation with the wind farm or its agents and associates.**
    - **Every day on which noise from the wind farm exceeds the specified noise criteria or exceeds INP noise conditions will constitute a breach of the project's noise conditions. Each breach will attract a financial penalty equal to the maximum financial penalty for any form of pollution under then current NSW laws and the Clean Energy Regulator will be notified that the wind farm was non-compliant for the day of the breach.**
    - **If the breach is notified to the wind farm operator by the EPA, payment of the penalty will be to the NSW Government. Should the EPA decline to prosecute a breach, NoiseCo may notify the operator and the penalty will be payable to NoiseCo.**
    - **Should the operator dispute any breach the matter will be referred to the Land & Environment Court for the sole purpose of determining whether a breach has been proven. If it is judged proven, the operator will be required to pay all costs plus the penalty to the party that notified the breach.**

It is unusual to propose that a non-government party have the authority to prosecute breaches in this way. However, residents need the ability to take quick action to avert torture through sleep deprivation. Sadly government agencies have displayed a recurrent failure to act against noise pollution and its consequent effects.

The mechanism proposed here gives the first right to the EPA to act and, only if it fails to do so, does the right pass to the afflicted residents via NoiseCo. Should the EPA, on behalf of the government, fail to act, then the government has no right to the penalty which should pass to NoiseCo to help fund any actions it needs to take in protecting residents. Given the normal attitude of Government Treasuries, this arrangement would provide encouragement for the EPA to always act instead of leaving it to NoiseCo.

Fire Hazards

The EA includes a section on fire hazards and bush fire hazards. It is nice to know that "a bushfire management plan would be prepared"[59]. Of course only a person with no experience of dealing with a bushfire and a rural locality could imagine that preparing a paper plan is the answer. There is also an insulting implication that RFS volunteers in the area do not already have plans for dealing with bushfires.

Fighting a bushfire depends heavily on volunteers living in the locality, if the wind farm does not drive too many of them away. These are the very people whose lives in other respects are likely to be blighted by the wind farm and whose properties will face increased risk due to the presence of the wind farm.

The section on bushfires fails to address in any way the effect on the availability and willingness of RFS volunteers after establishment of the wind farm.

The section includes a summary statement:

> "While the risk of bushfires would be increased by the construction and operational activities of the wind farm, the cleared nature of the land and the improvements to site access would aid fire fighters on site."

It is unclear whether this is a statement from the RFS or simply by the EA's authors, whose relevant expertise is unclear. Even if it is from the RFS, does that offsetting benefit apply to properties near the wind farm or simply to the wind farm itself?

While the statement is meant to convey reassurance, it could easily be hiding the fact that the existence of the wind farm will increase the chance of bush fires in its neighbourhood but it will be easier to fight them to protect the wind farm but not any easier to fight them to protect the neighbouring properties.

In addition, it is generally understood that massive turbines make water bombing more hazardous, particularly when they may be partly concealed by smoke and this problem will exist whether the turbines are operating or not. That in turn makes neighbouring properties less defensible, which is skated over in this section of the EA.

In attempting to assure us all will be OK re fighting bushfires, the EIS gives us this pearler of a statement:

> "They [the RFS] have also stated that wind farm infrastructure is no different, with regard to bush fire risk, from similar large scale infrastructure developments."[60]

The statement may be perfectly true. Next question, aside from wind turbines, how many other man-made structure are there in rural NSW that are 165 metres high and with a spread of 130 metres? There are only about 20 buildings in the whole of Sydney taller than these structures, and none of them is 130 metres across (wider than most city blocks). And none of them has rotating parts moving with great rapidity.

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[59] EA, p. 225.
[60] EA, p. 226.

And where else is there a cluster of almost 300 of these industrial structures in rural NSW?

The only structures in rural NSW, indeed anywhere in NSW, that are similar are other new wind farms. So the supposedly reassuring statement from the RFS amounts to no more than saying this wind farm will be no more of a problem than other new, big wind farms. But then fails to in any way discuss the firefighting problems such wind farms may create in protecting surrounding property.

The DPE/PAC should not accept any of the bushfire assessment provided in this EA. The DPE/PAC needs to obtain from RFS, and in particular an identified person in RFS, the answers to the following questions:

- ***To what extent will the existence of this wind farm increase the likelihood of bush fires for neighbouring properties, during both construction and operation?***
- ***To what extent will the existence of this wind farm increase the difficulty of protecting neighbouring properties in the event of bushfires, whether they are due to the wind farm or other cause, and thus the likelihood of bushfire losses for neighbours?***
- ***What guidance will the RFS give to airborne firefighting resources about operating near the wind farm?***

The answers to those questions need to be based on the specific situation around Liverpool Range, not on a generic view of the matter.

LRWF Decommissioning Plan Gross Financial Defects

Risible Proposal to Fund Decommissioning

The developer has stated that decommissioning costs will be $103-115 million. Presumably that is in today's dollars and will be very substantially more by the time of decommissioning. DPE/PAC has no right to give approval on any basis that could leave NSW taxpayers or local ratepayers exposed to such a huge amount.

The document presents a risible proposal to fund decommissioning. That proposal cannot be relied upon, so any approval of the proposed decommissioning "plan" would involve the approving authority exercising their official functions in a partial manner beneficial to the developer, which is corrupt conduct under the ICAC Act.

The developer's funding proposal is based on what it claims it will get in scrap value in 20 or 30 years time. To estimate scrap value it uses the current value of reconditioned turbines. But of course the latter includes the cost of reconditioning and a profit margin on top. So obviously selling your scrapped turbines will be for much less.

More importantly, scrap value at decommissioning depends on global demand at that time for used turbines and on the overall state of the global economy. The developer, in this proposal, is setting itself up as an economic forecaster for 2 or 3 decades hence, and expecting the DPE to pretend that it is competent to judge those forecasts.

As we have seen repeatedly, government economic agencies like Treasuries, central banks and international bodies like the IMF, are unable to accurately forecast economic conditions even a few years ahead, let alone a couple of decades. None of those bodies forecast the GFC or the prolonged economic malaise that has afflicted Europe and the US since then.

But threats to future prices of used wind turbines are far broader than that. The boom in renewable energy construction may be over, if only because the world is then full of wind turbines. Or renewable energy economics may have moved in favour of solar, so there is much weaker demand for turbines. Or turbine manufactures may have introduced far more cost effective models, depressing prices of old, used models. Or any number of other possibilities.

The simple fact is that neither the developer nor anyone else has any idea what the real price of turbines will be in 20+ years. But they pretend they have, and they expect DPE to pretend it believes them and accept their pie in the sky plan for funding decommissioning.

Further, earlier in this critique it has been shown that the developer has presented misleading information on the need for additional electricity capacity for NSW. It has done this by citing old reports from AEMO when much more recent ones are available from the same body providing evidence-based forecasts far less favourable to the developer's case. ***The willingness to provide misleading forecasts, even when more accurate ones are available in the public domain, clearly demonstrates a willingness to bend numbers to suit the developer's interest and, accordingly, no numbers the developer offers can be relied upon, including its forecasts of decommissioning costs and funding***.

The proposal also says "Should this positive cost / sale balance tip negatively in the future the Proponent has agreed to ensure an appropriate financial instrument is put in place to ensure the works can be funded. A bank account is the financial instrument to be used."

This apparently means that for the next 20 or 30 years the DPE and its multiple successors is supposed to continually make forecasts of the changing future scrap value of the facility, and of the changing costs for decommissioning and remediation and, if it judges the latter exceeds the former, tap whoever is then the owner on the shoulder and ask them to please put some money in a bank account.

Of course if you discover some years down the track that the prospective scrap value is not looking too good, it may well be this is because overall demand for the industry is down. In which case there is a good chance the then owner will have financial problems and so will be unable to put any money into a bank account for this purpose. The ABC has recently drawn attention to the risks in this regard[61].

In addition, the government can have no idea of who will own the wind farm when it comes to decommissioning. Epuron developed the plan for Gullen Range Wind Farm (GRWF), then onsold to Goldwind, which has set some sort of record by mis-siting 69 of the 73 turbines approved for GRWF. That wind farm may well be onsold again, so that by the time of decommissioning, it is in the hands of a $2 company whose balance sheet consists of a decrepit wind farm and a lot of liabilities.

The same pattern may well play out for the LRWF. Indeed the EA includes a table listing other Epuron wind farm projects[62]. Of the 6 projects listed as operating or approved, 4 have now been sold to other parties. So the likelihood of Epuron being the long term owner of LRWF seems slight.

Protecting NSW Taxpayers

If LRWF is approved, the government cannot predict who will own it when decommissioning is due, and it certainly cannot predict the financial state of the then operator. The DPE must ensure there is a decommissioning funding plan that is totally reliable irrespective of what happens in ownership changes or the financial state of operators over the years.

The appropriate arrangement is to require the proponent to provide a bank guarantee to the government, to cover removal of the turbines, remediation of the site, and repair of all road and other community damage caused during the decommissioning stage.

A large bank is far more able to assess the future economics of these matters than is the DPE or any other government agency. Risk assessment and credit risk assessment, the pricing of risk and determination of appropriate security, and the monitoring and management of these, are their business. A large commercial bank will determine appropriate fees and collateral requirements to cover the future costs and associated risks.

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61 See http://www.abc.net.au/news/2014-05-15/clean-energy-bodies-slam-budget-cuts-in-the-sector/5455902 where, on the ABC, the CEO of Infigen warned that "If [they] took the RET away tomorrow ... we would lose 40 per cent of our revenue and our Australian business would fail ... along with nearly all wind farms and wind farm businesses in Australia."

62 EA, p. 26.

That makes the matter wholly a commercial one, aside from the government contractually specifying the required remediation, to be dealt with in the financial markets with the full cost being transparently borne by the developer.

If the bank is convinced that the cost of meeting these commitments will be more than covered by the scrap value of the plant, then the guarantee's cost to the developer will be small. On the other hand, if the bank takes a less optimistic view than the developer is expecting DPE to accept, then it will raise the fee.

Government agencies have no real capability to deal with these commercial assessments, or things like collateral requirements and work outs if necessary, and should not attempt to take them on. Doing so only guarantees that the taxpayer or local rate payers will ultimately be on the hook and the government will have made another gift to another developer.

The developer's supposed contractual arrangements with hosts are irrelevant in this matter. They don't change the economic uncertainty and hosts are hardly likely to be in a position to enforce their contracts against an owner that may well have failed financially.

If the proposal is approved, it should be with tightly specified decommissioning requirements, including repair of all community assets that may be damaged in the process, and with the whole to be covered by a bank guarantee that the developer must pay for and tender to the NSW Government BEFORE construction can commence.

If the developer tells the DPE that this arrangement will be too expensive, the developer will be telling the DPE that the remediation financing risks are far higher than it has presented in its proposal.

Need for Protection Mechanism is Wind Farm Specific

Note. The need for bank guarantees to cover end-of-life decommissioning is not relevant to most commercial developments. It is specific to wind farms because of their rather unique siting characteristics.

Most industrial and commercial developments are on sites owned by the developer, usually in urban areas, where the site has significant value in itself, where the value is fairly well understood and usually growing as a consequence of continued urbanisation. Thus there is a wholly reasonable expectation that the owners of the site, will be in a financial position to fund changes when any structure on the site has come to the end of its economic life, without the costs falling on the taxpayer.

Wind farms are very different. They are built in relatively remote locations where the future value growth of the site is uncertain but more importantly, the developer usually does not own the site, so they do not have an ongoing asset in the value of the site. They lease access to parts of sites and those leases do not constitute an economic asset except in relation to operation of the wind farm. When it ceases to operate there is no economic value left to the wind farm operator.

So the recommended bank guarantee for wind farms cannot be rejected on the basis of creating a problem for other commercial developments because the remediation /

decommissioning of most other commercial developments is essentially self-funding, in a well understood manner, based on site value – an option generally absent for wind farms.

Uncertain Ability to Rely on Advice Provided

Both the noise analysis consultant and the LVIA consultant, and perhaps others, have included very restrictive caveats in their reports. Those caveats say the advice is only for Epuron and cannot be relied upon by any other parties without written authorisation by the consultant.

Unless the DPE has received such written authorisation covering itself, the PAC and all residents potentially affected, it is bound to reject those documents as part of the developer's submission.

The DPE/PAC cannot accept the information as professional advice and, at the same time, accept that it cannot be relied upon. To do so would be to participate in a fraud, one that would very likely act to the disadvantage of residents adversely affected by the proposed development. That would clearly be a case of improperly exercising official functions in a partial manner that constitutes corrupt conduct.

The DPE/PAC should ensure, in writing, from all consultants whose advice the developer has tendered, that both the DPE/PAC and residents are entitled to rely on the advice given by the consultants. In the event the consultants are unwilling to provide that coverage, the DPE/PAC would have no option but to require the developer to find consultants who fully stand behind their advice.

Inability to Rely on Developer

As we have seen earlier, the developer has displayed consistent reasons not to rely on them. Whether this is through incompetence or just a disregard for the department and for local residents is a matter of speculation. However, we have seen:

- The attempt, based on outdated AEMO reports, to persuade the department that NSW will soon need additional electricity supply when more recent AEMO reports, available to the developer, indicate that any shortfall is a decade or more away, and AEMO reports leading up to the most recent have been showing lengthening estimates of the time for a shortfall.
- Complete disregard for the department's requirements for real consultation and engagement with the local community. This has taken the form of a CCC that in no way reflects the principles for a CCC described in the NSW draft guidelines for wind farms, despite the fact the developer said they would comply with those guidelines. And their behaviour led to a formal rebuke from the head of the Department of Planning and Infrastructure.
- In addition, in an attempt to pretend there is strong support in the locality for their wind farm, they relied not on a local survey but on more general surveys that have been shown here to be completely inappropriate in establishing claims the developer wants to make. That includes failing to notice one of those documents tried to generalise to the whole rural population from a sample of 27 people, most of whom were selected precisely because they had interests in wind farms or supported them. And the developer failed to noticed the other survey upon which it relied shows that support for wind farms is substantially less in the Upper Hunter precinct than in other precincts.

Thus, any approval arrangements that relied on the developer's strict attention to facts and its care and regard for the local community and protecting the interests of that community would be flying in the face of contrary behaviour demonstrated in the EA and in the process leading up to it. Accordingly, such arrangements would clearly amount to "improperly exercising official functions in a partial manner"[63] and thus should not be entered into.

Unreliability of Actual Turbine Placement

In its EA, the developer states[64]:

> "The current project layout contained in this EA is indicative only and is subject to detailed design."

and then says:

> "Detailed geotechnical investigations and final engineering design can only be carried out once consent conditions are known and a turbine supplier has been selected. This is because each wind turbine model is different and requires different spacing, access and exit gradients and crane requirements. Accordingly, the detailed design of the final wind farm layout (including

[63] See *What is corrupt conduct*? http://www.icac.nsw.gov.au/about-corruption/what-is-corrupt-conduct.
[64] EA, p. 34.

> the final locations of all turbines, on-site access roads and hardstands and associated infrastructure) cannot be determined until the construction contractor surveyor traverses the entire project site and incorporates the requirements of the final conditions of approval. It is therefore essential for efficient project delivery that the consent authority provides this necessary flexibility by authorising the micrositing of infrastructure, in accordance with the conditions of approval, anywhere within the assessed Project Corridor. Accordingly:
>
> - the current layout is indicative only and subject to detailed design; and
> - Epuron seeks consent to microsite turbines and infrastructure anywhere within the assessed Project Corridor."

So these problems arise because Epuron hasn't made up its mind about which turbines to use. They aren't exogenous problems. The developer should fully understand the guidelines about noise in both the draft NSW Wind Farm Guidelines and in the NSW Industrial Noise Policy and should have been designing to meet them.

Visual impact on individual properties is determined taking account of the topography and the placement of individual turbines. Change the placement and you potentially change the impact on individual properties and in some case on important public view points, and not just those nearby.

Thus the developer is asking for open slather that could largely invalidate the LVIA even had it been done in an exemplary fashion consistent with the other recommendations made in this critique. The developer then says[65]

> "This final layout would include adjustments to ensure all criteria are achieved."

In other words, "Trust us", despite having shown in multiple ways that they are unreliable in complying with the department's requirements, in dealing with facts, and in showing real regard for the local community.

There should be no "micrositing" provision. The developer should be required to establish, in advance, exactly where its turbines will go and to have fully evaluated the resultant impact in terms of visual pollution, noise pollution and other considerations, within existing guidelines.

[65] EA, p. 36.

Conclusion

Strategic Grounds for Rejection

Unless the department believes it is NSW Government policy to:

- *raise consumer electricity prices very much faster than by depending on conventional forms of electricity generation; and*
- *impose the greatest hardship from this policy on the lower income segments of the NSW population.*

then the proposal is inconsistent with NSW Government policy, since the proposal will contribute to driving up electricity prices for NSW consumers.

In addition, given the supply-demand balance in NSW, as estimated by AEMO, there will be no shortfall for at least a decade and so the proposal is totally superfluous to meet electricity requirements in NSW.

Thus, the proposal for the Liverpool Range wind farm should be rejected on strategic grounds. If resubmitted, it should not be reconsidered until:

- **AEMO forecasts indicate a supply shortfall may arise within 5 years; and**
- **NSW consumer electricity prices have demonstrably stopped rising materially faster than the CPI.**

Since this proposal is clearly unwarranted on strategic grounds, **should DPE/PAC be unwilling to reject on that basis, DPE and its Minister should explain to everyone the purpose of this requirement included in all wind farm EARs.**

Multiple Fatal Defects

Appalling Consultation and Engagement Record

The developer's record of consultation and engagement with the local community is appalling. It has tried to paper over that by invoking surveys not specifically related to the locality and which turn out to be beset with critical flaws that make them invalid for this purpose, not least being that one of the surveys indicates the Upper Hunter region was (in 2010) relatively unsupportive of wind farms.

If the consultation requirement is meant to be real, then the DPE has no alternative but to:

- **reject all purported claims of appropriate consultation by the proponent;**
- **reject the EA and tell the developer to come back when it can demonstrate a lengthy period of real consultation with the broad community in the area and particularly those who are potentially directly affected in various ways.**

Deficient Landscape and Visual Impact Assessment

Since the LVIA admits that it rests on the subjective judgement of its author, and there is clear evidence indicating the author is likely to be unavoidably biased against the interests of local

residents, the LVIA cannot be accepted as valid. In addition, the LVIA has been restricted to a Zone of Visual Influence (ZVI) of 10 kms, less than one quarter the distance recommended as best practice for wind turbines of the height proposed for the LRWF.

Consequently, the DPE/PAC should require that the LVIA be redone:

- **using an assessment panel of 3-5 assessors that fairly involves non-aligned locals (at least 2), transparently chosen, and with all the assessments being reported to the DPE; and**
- **using a ZVI of at least 45 kilometres, as recommended in *Visual Representation of Wind Farms* by Scottish Natural Heritage.**

Meaningless Bushfire Assessment

The bushfire assessment consists of glib statements that demonstrate nothing about the effect of the development on bushfire risks created for nearby residents, who might reasonably expect that the wind farm will raise those risks for them.

The DPE/PAC should not accept any of the bushfire assessment provided in this EA. The DPE/PAC needs to obtain from RFS, and in particular an identified person in RFS, the answers to the following questions, specifically in relation to the Liverpool Range locality:

- ***To what extent will the existence of this wind farm increase the likelihood of bush fires for neighbouring properties, during both construction and operation?***
- ***To what extent will the existence of this wind farm increase the difficulty of protecting neighbouring properties in the event of bushfires, whether they are due to the wind farm or other cause, and thus the likelihood of bushfire losses for neighbours?***
- ***What guidance will the RFS give to airborne firefighting resources about operating near the wind farm?***

Uncertainty Whether Consultant Advice Can be Relied Upon

Both the noise analysis consultant and the LVIA consultant, and perhaps others, have included very restrictive caveats in their reports. Those caveats say the advice is only for Epuron and cannot be relied upon by any other parties without written authorisation by the consultant.

The DPE/PAC cannot accept the information as professional advice and, at the same time, accept that it cannot be relied upon. To do so would be to participate in a fraud, one that would very likely act to the detriment of residents adversely affected by the proposed development. That would clearly be a case of improperly exercising official functions in a partial manner that constitutes corrupt conduct.

The DPE/PAC should ensure, in writing from all consultants whose advice the developer has tendered, that both the DPE/PAC and residents are entitled to rely on the advice given by the consultants. In the event the consultants are unwilling to provide that coverage, the DPE/PAC would have no option but to require the developer to find consultants who fully stand behind their advice.

Unreliability of Developer

The developer and, in another location, a buyer of its development, have repeatedly demonstrated unreliability and a wholesale disinclination to abide by conditions imposed by the NSW Government. Any proposal, as contained in the EA, that the developer have a right

to relocate turbines but will "promise" to ensure that has no adverse effect should be laughed out of court.

There should be no "micrositing" provision. The developer should be required to establish, in advance, exactly where its turbines will go and to have fully evaluated the resultant impact in terms of visual pollution, noise pollution and other considerations, within existing guidelines. Since the current EA does not do so, it should be rejected.

Essential Conditions Should the Wind Farm be Approved

Visual Easements

Recommendations in an LVIA are a wholly inappropriate way of dealing with the effect of wind farm visual pollution on the private interests of residents. The polluter, in this case a private entity, should be required to make commercial arrangements to compensate the other private entities (residents) affected by the pollution.

The developer should be required to acquire visual easements from all non-associated property owners within 10 kms of the wind farm or, alternatively, offer to acquire the properties at a genuine, independent third-party determined, unimpaired value plus transaction costs.

Health, Sleep Deprivation and Noise

The potential of noise from wind farms to cause recurrent sleep deprivation, which is torture, as well as other adverse health effects is indisputable and recognised in the NSW Government's Industrial Noise Policy. The DPE/PAC is wholly unable to judge whether that will occur in practice with this wind farm. However, they have clear evidence that the developer and parties to whom it has sold another wind farm cannot be relied upon to either willingly comply with conditions or to protect the interests of the community.

Consequently, the DPE/PAC has an obligation to establish operating conditions and controls that will ensure recurrent sleep deprivation and adverse health effects for residents are not allowed to happen in practice.

It is incumbent on the DPE/PAC to ensure that if the LRWF development is approved it is subject to mechanisms that detect all breaches of noise conditions established for the facility and that such events attract quick penalties sufficient to ensure compliance.

Should the wind farm be approved, consent conditions should:

- **Impose noise conditions that, if met, will reliably protect residents from recurrent sleep deprivation; and**
- **Require the wind farm developer/operator to fund:**
    - **The facilities needed to provide permanent, full-spectrum, sound monitoring around the wind farm at 12 points suitable to detect any breaches of the noise conditions.**
    - **The ongoing operation of those facilities, including relevant professional data analysis and interpretation for rapid detection of breaches.**
- **State that:**
    - **The facilities are to be under the joint control of the NSW Environment Protection Authority (EPA) and a non-profit corporation (here called NoiseCo) whose members are local residents with no commercial or other affiliation with the wind farm or its agents and associates.**

- **Every day on which noise from the wind farm exceeds the specified noise criteria or exceeds INP noise conditions will constitute a breach of the project's noise conditions. Each breach will attract a financial penalty equal to the maximum financial penalty for any form of pollution under then current NSW laws and the Clean Energy Regulator will be notified that the wind farm was non-compliant for the day of the breach.**
- **If the breach is notified to the wind farm operator by the EPA, payment of the penalty will be to the NSW Government. Should the EPA decline to prosecute a breach, NoiseCo may notify the operator and the penalty will be payable to NoiseCo.**
- **Should the operator dispute any breach the matter will be referred to the Land & Environment Court for the sole purpose of determining whether a breach has been proven. If it is judged proven, the operator will be required to pay all costs plus the penalty to the party that notified the breach.**

Decommissioning Funding

The developer has proposed a risible, self-serving "plan" for funding the eventual decommissioning of the wind farm. That proposal has the potential to leave the NSW taxpayer exposed to a remediation bill of $100+ million (in today's dollars) and the DPE/PAC has no capacity to assess the validity of the developer's estimates and the risks involved or to manage a program that would deal with changes over time in risks, owner financial viability, collateral requirements, etc.

If the proposal is approved, it should be with tightly specified decommissioning requirements, including repair of all community assets that may be damaged in the process, and with the whole to be covered by a bank guarantee that the developer must pay for and tender to the NSW Government BEFORE construction can commence.

Failure to impose such a requirement would involve the approving authority exercising their official functions in a partial manner beneficial to the developer at the expense of the NSW taxpayer, which is corrupt conduct under the ICAC Act.

Appendix A. Problematic Use of 2010 Community Attitudes to Wind Farms in NSW Survey

The *Community Attitudes to Wind Farms Survey*[1] was conducted in May-June 2010 for the Department of Environment, Climate Change and Water NSW. This survey is widely relied on by wind farm developers in their approval applications. It is unfit for that purpose.

Right at the beginning, the publications says[2]:

> "This report was prepared by AMR Interactive in good faith exercising all due care and attention, but no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect of, their situation. The views expressed within are not necessarily the views of the Department of Environment, Climate Change and Water NSW (DECCW) and may not represent DECCW policy."

Despite that clear qualification, those who cite the "results" of support for wind farms do not normally provide any evidence confirming its accuracy or fitness for their purpose.

The document is fundamentally unsound to support the proposal that a large proportion of potentially affected residents are, today, happy to have wind farms built near them.

A cursory review of the document displays multiple reasons why it is unsound for that purpose. They can be broadly covered under 4 headings: participants, timing, dubious "factual" responses, and value-loaded questioning.

Selected Participants

The survey covered six "Renewable Energy Precincts" running from the very north of the state to its southern border. Details, as reported in the document[3], are shown below.

Precinct	Pop	Town	WF Op	WF App	WF Ass
New England Tablelands	172	70%	0 / 0	1 / 27	2 / 250
Upper Hunter	30	64%	0 / 0	1 / 34	0 / 0
Central Tablelands	157	67%	2 / 17	1 / 9	1 / 40
NSW/ACT Border Region	101	71%	1 / 8	7 / 300	3 / 200
South Coast	234	54%	0 / 0	0 / 0	0 / 0
Cooma-Monaro	23	63%	0 / 0	1 / 16	1 / 125
Total	**717**	**64%**	**3 / 25**	**11 / 386**	**7 / 615**

Pop = Adult population (thousands); Town = % of respondents living in towns; WF OP = Wind Farms operating; WF App = WFs approved; WF Ass = WFs under assessment. For the last 3 columns the numbers f / t are the number of wind farms (f) and wind turbines (t).

[1] *Community Attitudes to Wind Farms in NSW*, Department of Environment, Climate Change and Water NSW, 21 December 2010.

[2] Op cit, p. 2.

[3] Op cit, p. 56.

Two thirds of respondents were living in towns. Since wind farms stay away from major towns, this means most of the respondents were living in situations where they were never likely to be affected by wind turbines. In fact the unrepresentative[4] nature of the respondents is even worse than that. One third of the population in the six precincts was in the South Coast precinct, which had no wind farms operating, approved or under assessment. It was a wind farm free area. When the South Coast population is included with those living in towns in the other precincts, they account for 565,000 of the total population covered, ie 79%. So only about 20% of the population sampled were living in localities where they were exposed to current or future wind farms.

Timing

The timing issue is immediately apparent from the table above. On the department's figures, at the time of the survey there were only 3 operating wind farms in those precincts, with a piddling 25 turbines between them. They were at Crookwell, Hampton and Blayney, standing less than half the height of, and only about 20% as powerful as, wind turbines now being built.

Even if the data collected at the time was perfectly accurate, it is quite apparent that the wind farm experience available to people at the time was minute compared to the situation now and that, consequently, attitudes expressed at that time cannot legitimately be imputed to people today.

Scarcely Credible Responses from Participants

The document reports respondents' claimed experience with wind farms[5].

- fully 97% said they had heard about wind farms. This is a recognition level that Mugabe would think a triumph;
- 81% had seen a wind farm / turbine; and
- an amazing 35% said they had been close enough to hear them operating.

The second two statistics are simply astounding. At a time when across all the precincts there were only 3 wind farms operating in remote locations with a piddly 25 small turbines, and with a survey population 80% of whom were town dwellers or living on the South Coast, nonetheless 81% had seen a wind farm and 35% had been close enough to hear them operating.

The proportion having heard a wind farm was highest in the NSW/ACT Border region (45%) but was at least one third in all other precincts except the New England Tablelands, where only 21% had heard wind turbines.

Bear in mind that you may see a wind farm in the distance as you are driving along a highway, but you won't hear it. Car and road noise will normally conceal it from those within a vehicle.

[4] "unrepresentative" in terms of potentially being affected.
[5] Op cit, Table 10, p. 26.

So do we believe that:

- those 25 small turbines then operating were being heard all across the state?
- that, unknown to some of us, there has been a very active business bussing people to Blayney and Crookwell to stand near the turbines to hear them, or perhaps a third of rural NSW has been travelling to South Australia to bone up on the noise of turbines?
- respondents were getting confused between commercial wind turbines and the small wind turbines that are found in rural areas for on-farm use? or
- respondents didn't have much of a clue about what they were answering?

If this was a random sample of NSW rural and coastal residents in 2010, with 80% of them living in towns or on the coast, the statement that one third of them had been close enough to wind turbines to hear them operating is simply not credible.

But if such an important "factual" statement is seriously questionable, then so must be all the other answers elicited in this survey.

Value Loaded Questions

After some initial demographic questions and questions about duration of residence and perceptions about the respondent's local region, the survey got into attitudes and beliefs by opening with the statement:

> *A number of clean energy sources are being discussed. Which clean energy sources are you aware of?*

That set the scene for the respondent in all the questions that followed. "Clean energy" is an emotive, value-laden term, since of course no one is in favour of "dirty energy".

If you are conducting an objective survey, you are supposed to avoid using value-laden terms, especially at the outset, because of their ability to bias all subsequent responses. This particular survey failed in that requirement.

Summary

Wind farm proponents attempt to rely on this survey to claim local acceptance in numerous rural localities where they want to build wind farms. As highlighted above, there are multiple strong reasons why the survey is unsound for that purpose:

- It was conducted at a time when there was very little real, local experience for respondents to draw on about the impact of wind farms.
- The wind turbines then operating in the regions covered were small and weak compared to those now being "justified" by this survey.
- Only about 20% of the people covered by the survey could reasonably be said to be subject to possible personal impact from wind farms, so the result is heavily skewed by those not so exposed.
- The unbelievably large responses about seeing and hearing wind farms, at a time when there were almost none operating in the large region surveyed indicates some

fundamental problem in sample selection or survey conduct or respondent's understanding of the matter upon which they were being quizzed, which means the results cannot be relied upon.

- The survey includes emotive, value-laden statements, which are normally avoided in objective surveys because they are known to skew answers.

Wind farm proponents, and particularly public authorities asked to approve wind farms, should therefore pay close attention to the caveat included at the start of the report on the survey:

> "no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances."

Appendix B. The Fatuous CSIRO Report "Exploring Community Acceptance of Rural Wind Farms in Australia"

The CSIRO report *Exploring Community Acceptance of Rural Wind Farms in Australia*[1] is a fatuous document that ignores objective data contrary to its conclusions and which is based on a minute sample (27 people) carefully selected to predominantly favour wind farm interests. It is rampant advocacy masquerading as objective research. Its only saving grace is that its authors reveal how great is the gap between their headline conclusion and the data considered.

The study concluded:

> "There is strong community support for the development of wind farms, including support from rural residents who do not seek media attention or political engagement to express their views." [2]

This is a very strong statement. Unfortunately, if you scour the report looking for quantitative evidence to back it up, you will find none. There are no hordes of retiring, unaligned, rural residents actually interviewed or polled to substantiate the conclusion. Given the lack of objective evidence offered, the conclusion can be regarded as nothing more than a fiction that fortuitously supported the needs of a part of the CSIRO committed to the growth of "renewable" energy and wind farms.

To be fair to the people whose names are on the paper, and who have described the data and skewed survey they used, it is always possible that the headline conclusion, which is totally unsupported by their data, may have been imposed by a CSIRO apparatchik who lacked any knowledge of scientific method and statistical analysis.

The 2010 NSW *Community Attitudes to Wind Farms Survey*[3] did at least interview about 2,000 respondents. It had some basis for claiming to use a representative sample. Did the CSIRO study interview 2,000 respondents? No! 200? No! 100? No. **It interviewed 27 people**. You can almost count them on both hands and feet.

Were they chosen at random? No! Were they chosen in a way that might give the slightest semblance of community representativeness? No!

So who were these luminaries upon whose views the report could base its very definitive conclusions? They were[4]:

9 representatives of wind farm companies
4 turbine hosts
3 community members known to be supportive of wind farms
4 local government representatives
4 community members known to be opposed to wind farms (in certain localities)
3 others

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[1] Hall, N., Ashworth, P. and Shaw, H., *Exploring community acceptance of rural wind farms in Australia: a snapshot*, CSIRO Science into Society Group, 2012.
[2] Op cit, p. 9.
[3] *Community Attitudes to Wind Farms in NSW*, Department of Environment, Climate Change and Water NSW, 21 December 2010.
[4] Op cit, p. 22.

So 16 of the 27 (60%) were known supporters of wind farms, while only 4 were known opponents. 13 of the 27, ie just under half (wind farm company representatives and turbine hosts) had significant financial interests in wind farms.

This startling sample composition was not a chance event. The authors tell us that they set out to talk with wind farm company representatives, turbine hosts, other supporters, local government, and identified opponents[5]. So they set out to interview a dramatically skewed selection from the community – and they definitely achieved it.

One third of their interviewees were representatives of wind farm companies. Think about that. What proportion of the rural population across NSW, SA and Victoria would be wind farm representatives? 1%? Doubtful. 0.1%? Maybe. Yet the authors end up with a sample in which wind farm representatives were 33%.

This sample has zero face validity to represent the population to which its conclusions are generalised. That's aside from the minute size of the sample. In any quality university, any postgraduate student that tried to base such a sweeping conclusion on such a small and obviously biased sample would be marked "**FAIL**" and advised to pursue a different career.

If there is one conclusion that legitimately might be based on the "data" in the report, it is:

"People who make money out of wind farms are in favour of wind farms."

The disjunction between the headline conclusion of the report and actual data has another problem. The authors did a "media analysis of articles published in popular national and state-based newspapers in the latter six months of 2010"[6]. This analysis found more articles rejecting wind farms (32) than supporting them (19)[7]. So the media analysis ran 63% / 37% against wind farms. Despite that, the authors were able to come to the very definite conclusion that:

> "There is strong community support for the development of wind farms, including support from rural residents who do not seek media attention or political engagement to express their views." [8]

This conclusion being based on interviews with 27 people, about half of whom had direct financial involvement with wind farms.

The study had one useful component. It did desk research on 9 wind farm developments and categorised the opposition that had been mounted towards each[9]. The report concluded:

4 had faced high opposition
1 moderate opposition
4 low opposition

Again, this dataset is hardly consistent with the headline conclusion presented by the report.

[5] Op cit, p. 22.
[6] Op cit, p. 24.
[7] Op cit, p. 24.
[8] Op cit, p. 9.
[9] Op cit, p. 20.

But their data tells us more than that. Of the 4 low opposition wind farms, 2 were quite small with 5 and 12 turbines respectively. When you take wind farms of industrial scale, opposition was

3 high
1 moderate
2 low

The 1 high opposition case that would now be seen as non-industrial scale was Crookwell which, when built in 1998, was a large industrial intrusion in its area.

So 2/3 of the industrial scale wind farms had moderate to high opposition and, nonetheless, the report's authors were able to claim there is strong community support for wind farms.

Given that the report is so explicit about the evidence considered, there can be no dispute that its headline conclusion is wholly without support.

Anyone with the faintest knowledge of statistical analysis understands you cannot generalise from a sample of 27 to a population of millions, most particularly when you have deliberately selected a sample which, as the report makes clear and was discussed above, is grossly unrepresentative of the population to which you are generalising.

It is even more embarrassing when the only pieces of quantitative data included in the report, limited as they were, are clearly contrary to what is said to be the conclusion. This document may well have a future in research methodology classes about how not to do social science research. It has certainly not done the credibility of the CSIRO any good.

Appendix C. Permanent, Reliable Noise Monitoring Mechanism

The following are proposed terms for the establishment of a permanent, reliable noise monitoring mechanism for the LRWF.

Establishment and Control

Within 2 months of the wind farm being approved, a non-profit corporate entity ("NoiseCo") will be established with its shares held by persons living within 10 kms of the wind farm and who have no commercial or other affiliation with the wind farm or its agents and associates, with membership open to all such individuals at a nominal cost.

The purpose of NoiseCo will be to monitor sound emissions in and near dwellings around the Liverpool Range Wind Farm, to identify breaches of noise conditions, to notify all such breaches to relevant government agencies such as the Clean Energy Regulator, to provide them with all relevant evidence and to ensure breaches are prosecuted. It will perform this function in conjunction with the Environment Protection Authority (EPA).

NoiseCo will appoint a board, elected by its members, to oversee its activities.

Funding

Liverpool Range Wind Farm will be required to pay to NoiseCo:

- The capital cost of establishing permanent, full spectrum sound monitoring for 12 dwellings, for one internal room and external to the dwelling in each case. DPE/EPA will determine appropriate market costs for acquiring and installing relevant equipment.
- An annual payment adequate to cover all operational costs including relevant professional data analysis and interpretation, and including costs of occasional relocation of facilities. This operational payment will be paid quarterly to NoiseCo.

All payments will be made within one month of falling due and if overdue will incur interest at the Commonwealth Bank's current basic BetterBusiness (non-residential secured) loan rate + 5%.

All operational, maintenance and data analysis costs for the sound maintenance equipment and its use will be borne by NoiseCo, which will have the right to raise funds additional to those provided by Liverpool Range Wind Farm.

DPE will determine an initial budget for NoiseCo to meet its purpose and consistent with the provisions of this document. DPE will review NoiseCo's financial position after one year of operation. If it is clear there is a substantial imbalance of revenue relative to expenses required to perform its function, future payments by the Liverpool Range Wind Farm will be appropriately adjusted.

In the event NoiseCo is wound up, any residual assets will be assigned to activities consistent with protecting communities from adverse noise.

Operation and Data Access

The monitoring facility will be broadly consistent with the illustrative setup given in Annex A to this Appendix.

DPE and EPA will have the right of full access to all monitored data and analysis arranged by NoiseCo, subject to appropriate privacy protection for residents of dwellings in which monitoring occurs.

Liverpool Range Wind Farm will have the right of full access to all monitored data, subject to appropriate privacy protection for residents of dwellings in which monitoring occurs. Any additional costs of providing this data to Liverpool Range Wind Farm, eg for media, communication links, pre-processing, will be billed at cost to Liverpool Range Wind Farm by NoiseCo.

NoiseCo will have the right to relocate measuring equipment either at existing monitored dwellings or to new sites. All costs of so doing will be borne by NoiseCo. However, the company will be required to ensure there is reasonable coverage in all directions around the wind farm.

Breaches

For the first three months of wind farm operation and monitoring by NoiseCo, all breaches will involve only a warning from EPA to the Wind Farm, so the operator can adjust its practices to ensure no breaches.

Thereafter:

- Every day on which noise from the wind farm exceeds the specified noise criteria or exceeds INP noise conditions will constitute a breach of the project's noise conditions. Each breach will attract a financial penalty equal to the maximum financial penalty for any form of pollution under then current NSW laws and the Clean Energy Regulator will be notified that the wind farm was non-compliant for the day of the breach.
- If the breach is notified to the wind farm operator by the EPA, payment of the penalty will be to the NSW Government. Should the EPA decline to prosecute a breach, NoiseCo may notify the operator and the penalty will be payable to NoiseCo.
- Should the operator dispute any breach the matter will be referred to the Land & Environment Court for the sole purpose of determining whether a breach has been proven. If it is judged proven, the operator will be required to pay all costs plus the penalty to the party that notified the breach.

Annex A to Appendix C: Illustrative Noise Monitoring System Specifications

Technical Capability of a System

Standard, Customised and Turn-Key systems are available from manufacturers such as Bruel & Kjaer, Larson Davis, Norsonic. Generalised specifications for a monitoring system follow.

1. A customised noise monitoring system is designed, for example, to record Lmax, Lpeak, Leq, SEL, and statistical (e.g. L99 to L1) noise level indices in broad band and 1/1 and 1/3 octave band data (6.3 Hz to 20kHz) in defined time intervals [nominal programmable times: 10ms, 50ms, 100ms, 1s, 10s, 30s; 1, 5, 10, 15, 60 minutes; 24-hr], Ldn, Lden.
2. Standard noise level indices recorded include A-weighting, C-weighting and Z-weighting frequency profiles.
3. Identification of noise sources is provided through sound-file recording and live real-time audio streaming a remote data connection.
4. The system is designed to record audio (.wav lossless format) either continuously, during defined programmable periods (preferred) or using a noise level trigger.
5. System health is checked via remote calibration of the complete system on a daily basis. The calibration data allows for either automatic adjustment of the system (within stated tolerances) or a warning system for immediate maintenance.
6. A GPS module establishes the measurement location and security – for example, to detect if the station moves without authority.
7. Sound levels are displayed in real-time via smart-phone or remote computer with live recording to a map or display.
8. The complete system is designed to meet the requirements detailed in IEC 61672.1-Edition 2, 2013 and DIN 45657-2005.
9. A least one weather station is installed with wind speed and direction, temperature, humidity and rain sensors. The station sensors' height is 10 metres above ground level. A second weather station sited near the primary station may be installed with the sensors at 1.8 metres above ground level.

Microphones

1. A durable and robust free-field microphone and pre-amplifier designed for a Class 1 sound level meter as detailed in IEC 61672.1-Edition 2, 2013.
2. The selected microphone, pre-amplifier and shroud design is designed to minimise ongoing repair and maintenance costs, as much as practicably possible.
3. Remote calibration microphone adapter for regular system checking and calibration with long-term wind and rain protection shroud.

Communications Hardware

1. Reliable remote connectivity using LAN, WLAN, Internet or GPRS is designed to view and download data.
2. If wireless connection using a public data network is not available then data transfer is by default to the Telstra network. Data transfer is the most significant issue and therefore video and audio processing is carried out within the system computer in order to reduce bandwidth and upload demands.
3. All remote connectivity hardware and connection protocols are designed to be compliant with best practice industry standards as specified by relevant Australia and or International regulatory bodies. This includes a specification showing compliance for providing a secure wireless data network where designed.

Power

1. Each noise monitor is designed to be provided with a continuous, reliable and proven battery and/or solar power solution. The solution is designed to be capable of powering all components (Sound Level Meter, Modem etc) at all times. Battery life is designed for continuous operation with all components operating.

Data Management, Interface and Reporting

1. The operation, control and management of the noise monitoring system are designed to be centralised from a remote office location.
2. The system is designed to have the capability to view (over a remote connection from multiple noise monitor locations) noise level indices in real-time. This is achieved by using dedicated system software or a web-based user interface (preferred). Real-time noise level indices include, but not be limited to for example: LAF (1s), LAeq (1s), LA10,(time); LA90,(time); LAeq,(time); LAmax, LCmax; and summary report (time) where (time) is the measurement time period and at the end of day (24hr).
3. The system is designed to incorporate a solution for long term data storage (minimum of 12 months). Long term data storage requirements will be discussed with relevant parties.
4. Report templates are designed for clear description and presentation of information to readily and effectively assess the noise emission data and to highlight breaches of the noise conditions. Daily, weekly, and monthly report templates are prepared for ease of incorporation into reports. Raw data is also stored for spreadsheet (e.g. Excel™ 2013 format).
5. The system is designed to be able to integrate weather data (wind speed, wind direction, temperature, humidity, precipitation) to noise data and display same in a report to readily and effectively assess the data. The system is designed to support the ability to tailor reports to meet more specific requirements.

Installation

1. The noise monitoring station is to be designed to be installed semi-permanently or permanently on-site. The system design includes the method for providing a fixed, secure and permanent installation. The complete system is designed for locations with different capability in terms of existing services (eg power, communications), physical environment and existing structures.
2. The instrument case is to be designed to be permanently located in an outdoor environment, exposed to the prevailing weather conditions across the whole year; for example, temperatures of -10°C in winter and 50°C in summer. All equipment is to be designed to perform accurately in these conditions as well as any other climatic conditions (such as wind, rain and humidity) that are typically experienced in a locale.