Maggie Juniper/SURFCOAST/AU
10/07/2008 05:31 PM

To info@surfcoast.vic.gov.au
cc Brydon King/SURFCOAST/AU@SURFCOAST
bcc
Subject Fw: Objection to the Winchelsea wind farm project

Maggie Juniper
Senior Statutory Planner
Surf Coast Shire
tele: (03) 5261 0527
fax: (03) 5261 7131

----- Forwarded by Maggie Juniper/SURFCOAST/AU on 10/07/2008 05:30 PM -----

"Staples, John \(VIC\)" <jaStaples@arcbs.redcross.org.au>

10/07/2008 03:29 PM

To <david@futureenergy.com.au>, <MJuniper@surfcoast.vic.gov.au>
cc
Subject Objection to the Winchelsea wind farm project

My name is John Staples and I own a 60 acre property at 305 Mount Pollock Road Buckley.

As one of the land owners who is adversely affected by the proposal to develop the wind farm, I lodged an objection with the Surf Coast Council and intend to speak at the hearing on 15th July.

I have many concerns regarding the development, but as I am very close to the towers, I am particularly concerned as to the negative impact that noise will have. The impact of loud noise and low-frequency sound from similar plants are well documented and have been shown to have adverse health outcomes and negative impacts on quality of life.

While I do not have a residence on the property at this time, It my intention to seek planning and building approval and erect a home and move there when the children have left home (about 3 years). This has always been our intention and we have aspirations that always included a peaceful life in an idyllic Australian rural setting. We have had a successful planning permission, and while it is currently lapsed, we intend to apply again in the future.

To this end, I request that a base line noise study be conducted before work on the wind farm commences, so that any negative impacts of an operating generating plant can be assessed using clear empirical data.

Please respond to acknowledge receipt of this request.

John Staples
National OHS Advisor
Australian Red Cross Blood Service - Dedicated to transforming lives

Level 6, 464 St Kilda Road
GPO Box 5103 Melbourne VIC 3001
Ph: 03 9863 1616

"Barwonleigh Agriculture"

P.O. Box 239, Inverleigh
Victoria 3321,
Australia
Phone/Fax (03) 52 651210

Australian Business Number: 29224195896

◆◆◆◆◆◆◆◆◆◆◆

14th July 2008

Acting Director of Planning
Surf Coast Shire
25 Grossmans Road
Torquay

Dear Mr King,

Re: Planning Proposal 08/0039 Mt Pollock Wind Energy Facility

We write as the landowner and the directors of the businesses operating on the property known as 'Barwonleigh" (your address 150 Barwonleigh Lane, Inverleigh and 440 Gnarwarre Rd., Gnarwarre) namely 'Barwonleigh Agriculture' and DMC Super Fund P/L. This property of 2359 ha is used for commercial agricultural purposes only and we rely totally on the income derived from these pursuits. Over the past 15 years we have been battling the weed serrated tussock which took hold around the rocky south end of the property and spread very quickly all over this farm. To eradicate this pest we have had to invest a huge amount of capital to aerially spray and clear rock barriers; introduce tracks and water; revegetate and fence areas to enable us to change our predominant enterprise from growing fine wool to cropping. We have proven this to be the most efficient way of controlling this problem. For us, this has been a huge undertaking personally as well as financially.

Our property has the biggest frontage to this project and will be exposed prominently to all 14 proposed wind towers from any point on the property, many only being meters from our fencelines. We consequently wish to raise again some concerns that we feel will impact on our agricultural businesses.

1. The possibility of our capital improved land being devalued and restrictions to our future business opportunities
   At present our titles in this vicinity would allow us the granting of a building permit for a dwelling and/or division into smaller farms. Dwelling permits will not be possible with the towers sited so close to our boundary fences and subdivisions will not be as attractive to buyers so close to these towers. Therefore business opportunities for future rural initiatives at these sites for us will be limited.

2. This project, having added community interest being encouraged by the inclusion of a viewing platform, as well as employee traffic from the addition of another local work place, is a threat to our farm security and quarantine routines necessary for intensive farming. This is already a problem with fences being broken, stock and plant stealing and constant trespassing. It also adds pressure to our public risk policy. Not even a vegetation barrier has been allocated to us in your report.

3. Added congestion on the roads surrounding our farm
These roads have only been designed for occasional car usage. Already the traffic has increased enormously on the Inverleigh- Winchelsea Rd. with many trucks using this now as their route through to Geelong and the future Ring Road. The existing maintenance does not cope now with added wear and tear and make the roads dangerous. Adding more large construction vehicles to the agricultural machinery already trying to use these roads especially at sowing and harvest time, will mean our employees will be at greater risk of being involved in accidents .

4. We have concerns that there will be interference with transmissions from the RTK base station installed partly by us and partly by Mr Peel and already on the top of Mt. Pollock. This system guides all sowing and spraying traffic actions done on our farm and is a vital tool in precision farming of today, for example in determining changes in crop row spacing annually etc. Your planning report only mentions telecommunication checks at nearby houses pre and post construction. We wish to request that the same be done for the RTK Base station so that any detrimental interference with reception can be addressed by the Wind Energy Operator also.

5. The close proximity of the towers to the road also give concern for crop spraying planes which need space to turn as they spray our crops growing right to the road fence. Our plantings are done North/South because of the fall in the land and the paddock widths going East/West are narrow in comparison. This concern has not been addressed, we believe, in your planning report. 100 m from the existing road for tower sitings is much too close!

6. Increased risk of our farm being burnt out by fire is still a high concern. The towers in conjunction with the naturally occurring ironstone on Mount Pollock will be a dual attraction for lightening in this area. Access to the Mount area for fire fighting will be greatly restricted by rock barriers.

Finally,we request that a background noise assessment be completed before construction and a supply of windspeed data be given. This will enable an independent assessment of the noise monitoring situation in case of interference post construction with stock breeding programs, feeding routines etc

Hoping for your consideration
Yours sincerely

Maxine Campbell and Duncan Campbell

"Kathy Russell"
<the.mount@bigpond.com
>
10/07/2008 11:22 AM

To <MJuniper@surfcoast.vic.gov.au>
cc
bcc
Subject Wonthaggi efficiency

Hi Maggie

Thanks for the information. Have a look at the attached letter to Lois Townsend in Wonthaggi. Windpower provided the wind speed data for the period they did the compliance testing at her property. It was provided as it was a condition of the wind monitoring compliance process. They confirm in this letter the efficiency achieved during the period of testing. My maths calculates 21% efficiency how about yours?.

I have spoken to Lois extensively. Coincidental isn't it that the efficiencies are reduced during noise testing periods....leads to lower noise emissions and therefore compliance.

If there is nothing to hide with respect to efficiencies, why not release the wind speed data? What confidential business information is it protecting? It is protecting the ability of the company to manipulate noise eradings during testing periods....this is where you need to protect us!

And with regard to your article re base load capacity...I think it is obvious that there is plenty of evidence on both sides of this argument to support which ever moral high ground you wish to stand on. Difference is I have been out there speaking to the people who work with this system, from the people who do the work to hook them to the grid, to those who deal with keeping them going. The Vesta maintenance crew were not afraid to hide the fact that the Toora wind farm is constantly rejected by the grid due to instability problems. To protect itself, the grid shuts it off, which in turn stops the turbines from spinning because without a source of coal fired electricity, these turbines cannot operate. The technicians must then over ride the shut down...turbines don't operate again until they do.

I won't hide the fact that I am bitterly disappointed with your understanding of the noise issues and NZS6808. Very difficult to form fair conditions within respect to noise if you don't understand the issues. I have always been available and continue to be available if you wish to correct this anomaly.

Regards

Kathy Russell File0084.PDF

Wind Power
Management Pty Ltd

2 March 2007

Ms Lois Townsend
315 West Area Road
Wonthaggi VIC 3995

5672 1982.

Dear Ms Townsend,

RE: Wonthaggi Wind Farm

Further to your telephone messages regarding the Wonthaggi Wind Farm, I understand you request further information regarding:

- The time period in which **Post Construction Noise Monitoring** was undertaken.
- The post construction **Operational Data** previously supplied at your request.
- Reported information about the **distance of your residence to the nearest turbine.**

Post Construction Noise Monitoring

The Noise Studies at the Wonthaggi Wind Farm were undertaken by Marshall Day Pty Ltd. These studies were conducted independently from Wind Power Management Pty Ltd. Marshall Day's report (No.:2006033 001 R0 1) states measurements were undertaken for 19 days from 11:00am on 7 June 2006 until 11:30am on 26 June 2006.

I understand you recall that a noise logger was installed at your property on a date earlier than identified in the Marshall Day report. Marshall Day have been contacted by Wind Power Management and requested to clarify any differences in the dates that the noise loggers were installed your property and the dates identified in the report. Marshall Day responded to say that the noise loggers had also been installed at an earlier period. It was explained that the turbines were undergoing scheduled maintenance at that time, and, as the turbines would be too quite, it was determined to delay the monitoring until the period specified above.

Wind Power Management Pty Ltd
Suite 9 333 Canterbury Rd
Canterbury, 3126
Victoria. Australia
Ph: 61 3 9830 2700
Fax: 61 3 9830 2711
www.wind-power.com.au

Wind Power
Management Pty Ltd

Wonthaggi Wind Farm Operational Data

On 21 December, 2006 Wind Power Management Pty Ltd supplied generation data (showing 15 minute readings) for the Wonthaggi Wind Farm covering the period 7 June 2006 – 26 June 2006. The data was provided at your request. The agreed purpose was to allow you to confirm that the wind farm was operational during the period in which noise monitoring was to be undertaken. Provision of the data was a requirement imposed by you as a condition to allowing noise monitoring to be undertaken. This was because you planned to be on holiday during part of the monitoring period and so would be unable to personally confirm the operation of the turbines

I understand you now request additional information about the generation data supplied for the monitoring period because, in your view, the data readings appear too low. In particular, you ask for average generation during the monitoring period.

I am able to confirm from the data previously supplied to you that during the monitoring period the wind farm generated 1159 mega-watt hours of electricity. This figure is the sum of the 15 minute data. It follows that average generation is calculated as:
1159 MWh ÷ (19 days x 24 hours) = 2.5 MWh per hour.

Distance of your residence to the nearest turbine

I understand you request Wind Power Management Pty Ltd to explain why the stated distance between the nearest turbine and your dwelling is reported differently in the Victorian Government Planning Panel Report (2003) and the Marshall Day Noise Monitoring Report (2006).

I have looked for references to your dwelling in both documents;

The Panel Report states: *"The Townsend dwelling is located approximately 340 meters from the property boundary and 640 meters from the nearest proposed turbine shown on the aerial photograph." (p.6.)*. The pre-and post construction Noise Monitoring Reports prepared by Marshall Day P/L state that the distance from the Townsend residence to the nearest turbine is 850m.

Please note that both these bodies make their own assessments and write their own reports. However, I will try to shed some light on this for you. The Panel note in their remarks that they are identifying an approximate distance derived from an identifying mark placed on an aerial photograph. I read this as an indicative description of distance rather than a measured distance. Had the Panel intended to remark on an accurate measured distance, it would seem probable they would have made mention of a measuring devise or perhaps GPS coordinates, rather than a mark on an aerial photograph.

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Wind Power
Management Pty Ltd

The Marshall Day report concerns acoustic measurement and I understand their reference as to the distance from your residence to the nearest turbine is included for descriptive purposes. Further to this, I understand that the applicable noise standard to which the Facility must comply is not based around the distance between houses and wind turbines.

From my reading neither the Panel nor Marshall Day rely on the accuracy of measured distance to support their findings and the proximity of your dwelling to the nearest turbine was well understood by both these parties.

I trust this information is helpful in answering your queries.

Kind regards,

Vaughan Hulme
Manager

Cc: Geoff Hilton MLA
Elaine Wood DSE

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Canterbury, 3126
Victoria. Australia
Ph: 61 3 9830 2700
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Aviation Lighting

As new wind farm developments inevitably propose turbines which are getting taller and taller – new requirements become enforceable with respect to aviation lighting.

As the "Policy and planning guidelines for development of wind energy facilities in Victoria" were formulated almost 10 years ago and were first adopted in 2001 – they omit provisions on areas such as lighting as they had no way of envisaging the likelihood of this requirement.

To this end, no assessment of the affect on residents is presented with respect to this issue in the developers application, and similarly no mention of any real substance is made in the officer's report notwithstanding this information was provided to Ms Juniper.

The Officer's report concedes that aviation lighting will be visible from windows in our house and from outside and other parts of our property – it recommends shielding of obstacle lights to minimise the visual impact but DOES NOT TRANSPOSE THIS AS A CONDITION.

In addition to this, I question to what extent CASA allows shielding of obstacle lights. If the lights are present to warn aircraft of their position, they wouldn't want to shield them at the source to protect impact from our elevation on the ridge.

Following is the information provided to Ms Juniper from the Yaloak Wind Farm planning panel report on its assessment of the affect on amenity of aviation lighting. Other panel report findings are quoted in the Officer's report, but it is strangely silent on this issue:

"A night time inspection of the operating lights revealed that the obstacle lights are highly visible from distances of up to 25 kilometres with impact occurring both from the primary light source, and from reflection off the rear of generator blades (thus increasing their impact). There was general agreement at the site inspection that the amenity impact of the lights is unacceptable and that the lights would have a significant impact on residents…"

Panel Conclusion on aviation hazard lighting

"The Panel agrees with Pacific Hydro and other submitters that aviation hazard lighting on the proposed wind generators would have an unacceptable visual impact on the surrounding area at night. Should a permit be issued for the proposed windfarm the Panel supports inclusion of a condition to the effect that the wind generators must be designed to avoid the need for installation of aviation hazard lighting on any of the wind generators.

Further, at a general level, the Panel concludes that CASA's hazard lighting requirement adds an additional and important consideration in relation to wind farm developments. Panel notes that the CASA requirement may significantly reduce the number of acceptable windfarm sites by either:

- creating unacceptable lighting impacts; or
- forcing reduction of wind generator heights to non-viable levels.

The Panel recommends that:

On the basis of aviation impact considerations a permit should be issued for the wind farm with a condition requiring that wind generators must be designed to avoid the need for installation of aviation hazard lighting on any of the wind generators as required by CASA regulations at the time of construction (ie 110m).

In addition to this, lighting presents a significant interest to insects and therefore birds.

No assessment is made of this in any of the reports.

How about the effects on safe operation of the generator & related parts in terms of a fire risk? During the summer we have mass infestations of bugs getting into places never thought of before due to their attraction to lights.

How about the blades? Insect build up over time is apparently a problem as with any other aerofoil. The blades need to be cleaned otherwise too much build up which results in vibration and therefore unwanted noise.

How often do these blades need to be cleaned? High water pressure is the only available means for cleaning – by what method does the applicant plan to effect this?

Amount of water used? Probably not able to use recycled water due to the high salt content which could have a corrosive effect – also not good for salinity or the health of endangered vegetation around the turbines (High pressure water hitting an object at distance does not have directional control).

Is the use of clean drinking water at regular intervals in large proportions environmentally sustainable? Shouldn't this be added into the equation of benefits to the community?

<u>We believe that this same analysis should be made of the far reaching effects of lighting of turbines on the top of Mt Pollock and that this same conditions must be applied to any approval surrounding this development application.</u>

Visual Amenity – Landscape & Amenity Impacts

The United Nations has recently declared part of south-west Victoria as a globally significant geological area. The area known as the Kanawinka Geopark is the first geopark in Australia, and the 57th in the world to be recognized by UNESCO (United Nations). The park commences at Red Rock near Colac and extends across the Western Districts of Victoria to South Australia, in a lava belt approximately 100km wide, with the plains extending in valleys to the north of Ballarat and Melbourne.

Australia may be referred to as a relatively young nation, but the well preserved ancient landscape provides many precious windows into the past. International recognition seeks to safeguard and sustainably manage landscapes and geological formations which are key witnesses to the history of life on earth, thereby stimulating regional economic and cultural development.

Volcanoes included within the Kanawinka Geopark are specifically known as Quaternary 'Newer Volcanics'. As per the geology reports available for Mount Pollock, it is also described the same. Mount Pollock is a large lava dome with extrusive radial lava flows. The lava flows from Mount Pollock blocked the ancestral valley of the Barwon River and restricted the width of the valley between Leigh and Pollocksford.

Cultural heritage assessments for the site also identify that Mount Pollock would once have been adjacent to a larger lake that extended from Winchelsea to Camperdown; Lake Corangamite (the largest lake in Victoria), is the remnant of this lake (Hills 1975:314). Two small drainage lines occur on the slopes of Mount Pollock.

The cone location of Mount Pollock is representative of a 'quietly' erupting volcano formed by 'streams of molten lava flowing down the side of the volcano and across the lower plains'. Based on the topography, the site would appear to be absent from explosive activity during its formation. These formations formed more steeply sloping hills, and comprise scoria like material observed in 'fire mountain deposits'. Basalt rock is visible outcropping at the surface along ridges and at the hill top.

With regard to presenting a window into the past, Mount Pollock still supports significant endangered vegetation. Based on the site inspection, three EVCs were recognised as occurring at Mount Pollock. Identification of the EVCs was aided by DSE benchmark descriptions and descriptions by the Commonwealth and Victorian Regional Forest Agreement Steering Committee (2000).

EVC 68:Plains Grassy Woodland, EVC 132_61 Heavier-soils Plains Grassland and EVC 649:Stony Knoll Shrubland are all considered endangered in the Victorian Volcanic Plain bioregion.

In addition to this, two significant plant species were located within the Mt Pollock property. One was listed as endangered, the other as "poorly known in Victoria". Some components of the habitat present at Mt Pollock may provide potential suitable habitat for significant species, in particular the Striped Legless Lizard. Wind turbines

do present a collision risk to birds and bats during flight. The flight behavior of some species may put them at particular risk. Groups of species that may be exposed to greater risk based on their flight behaviour includes birds of prey (e.g. Wedge-tailed Eagle - numerically rare) and waterbirds that fly in dense concentrations (5 wetlands of state & national significance identified between 5-10km of Mt Pollock).

Contruction of the windfarm stands to remove much of this vegetation & habitat. 5 of the proposed 14 turbines are situated within these identified vegetation areas. There will be considerable geoblasting to establish concrete footings (2+metres deep) plus a second cement footing for each turbine must be blasted and poured to support the crane that must be constructed on site to erect the towers. Heavy duty roads must also be constructed through this sensitive area to each tower location to allow for the heavy equipment access. Underground electrical cables must also be trenched/blasted into the rock to join the infrastructure back to the substation.

The creation of the Kanawinka Geopark has been made possible through extensive support and funding from local government. Unfortunately Colac Otway Shire would not contribute. Thus Mount Pollock specifically has been excluded recognition as a site of geological significance as the trail had to begin somewhere. Chair person of the Kanawinka Geopark Joane Knight confirmed that because it is a volcanic 'trail', missing the Colac/Otway link meant that it was impractical to include areas from other shires. The cost over the 11 years it has taken to get UNESCO recognition is significant. The UNESCO delegation site visit cost $28k alone.

I have had advice from a Prof Bernie Joyce from Uni Melb that Mt Pollock does satisfy the criteria afforded to the volcanoes now recognised under UNESCO (see attachedemail).

With only 3 Volcanoes in the Surf Coast Shire, and Mt Pollock being the most representative in terms of presenting a window to the past as it is the only one still supporting significant endangered vegetation, it should be preserved from an environmental and tourism perspective as those afforded international heritage status nearby. EVC 68:Plains Grassy Woodland, EVC 132_61 Heavier-soils Plains Grassland and EVC 649: Stony Knoll Shrubland are all considered endangered in the Victorian Volcanic Plain bioregion.

This information was forwarded to Maggie Juniper via Donna Groves Environment Officer, Surf Coast Shire. None of this information was included in the Officer's report. The same report concluded with regard to visual Amenity & Landscape (sorry can't provide more specific reference details as there are no page numbers in this report):

- within a landscape which whilst attractive and valued by many local residents is not currently regarded as significant
- the area is entirely unaffected by planning provisions designed to protect the landscape character and there is no reason to suggest that the landscape character of the area will be attributed any significance in the future

These findings are contrary to what Steve McDougall from the DSE claims were identified in their studies commissioned by the council.

A mapping CD from DSE shows a section out of the tables that applies to Mt Pollock. Steve McDougall claimed that recommendations for EPO and ESO were made

ESO3(7)	Mount Pollock Grasslands	Yes	No	Yes	EVC Stony Knoll Shrubland (649) (endangered), Plains Grassland (132)(endangered) and Plains Grassy Woodland (55) (endangered). Small Scurf-pea (*Cullen parvum*) (EN, e, L), Basalt Tussock-grass (*Poa labillardierei*) var. (Volcanic Plains)(k), Purple Blown-grass (*Lachnagrostis punicea* subsp. *punicea*) (r).	Mount Pollock	EVC maps, aerial photo. Proposed wind farm site inspection. Site inspection from road

I found the whole assessment lacking in substance and contradictory in terms. The inclusion of this information would influence summaries in a different manner.

See following email from Prof Bernie Joyce from University of Melbourne

Other issues of heritage significance

As per Christopher Gordon, Geelong Branch of the National Trust

When explorers first discovered Geelong, there was an immediate attraction to the Barrabool Hills because there were NO TREES which meant that stock could be grazed immediately.

In addition to this, it was the regions only source of sandstone (known as Barrabool Stone). Along the coast, there are no other deposits of Sandstone as it has all been eroded away.

Conclusion

The considerable amount of rock that needs to be moved around the original cone area of Mount Pollock is significant. It is proposed that the access tracks for the turbines on the upper slopes of Mt Pollock will be oriented from the top of Mt Pollock down the slope. This will result in the removal of much of the formation which characterises Mt Pollock as a volcanic cone and cause extensive erosion issues. The Department of Primary Industries recognises Mt Pollock as significant and specifies that if enough open space can be maintained around the cone, it would retain the appearance of a volcano (see DPI website ref below). The proposed development at Mount Pollock will result in an irreversible change in characteristics of the landforms which make this particular geological form significant. Construction around the peak and upper reaches of Mt Pollock must not be allowed to occur.

Email from Prof Bernie Joyce follows:

Email from Prof Bernie Joyce – Uni Melb

-----Original Message-----
From: Bernie Joyce [mailto:ebj@unimelb.edu.au]
Sent: Tuesday, 1 July 2008 8:54 PM
To: Kathy Russell
Cc: Susan White; Joane McKnight
Subject: Re: Is Mt Pollock Quarternary 'Newer Volcanics'?

Dear Kathy,

You will find the web version of a description of Mt Pollock in "Rosengren, N. 1994. Eruption Points of the Newer Volcanics Province of Victoria. National Trust of Australia (Victoria) & Geological Society of Australia (Victorian Division)" at:

http://www.dpi.vic.gov.au/dpi/vro/coranregn.nsf/pages/corangamite_eruption_points_pollock

The more general page before that page is:

http://www.dpi.vic.gov.au/dpi/vro/map_documents.nsf/pages/cor_ep_geelong

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You ask:

Is Mt Pollock Quarternary 'Newer Volcanics'?

ANSWER: It's generally regarded as Newer Volcanic in age, and probably **Quaternary** (note spelling), or late Tertiary (i.e just a bit older).

Joane wrote to you:

he volcano near you are in what is termed the Older Volcanic Province and as such are older than Kanawinka. It is a geological line also the area of the Geopark has historically been promoted as the Volcanoes Discovery Trail which starts at Red Rock...

COMMEMT: Joane means rather older than volcanoes to the west, but it would still be described as Newer Volcanic in age, and is beyond (east of) the Geopark because the line had to stop somewhere!

Here is a further unpublished description (for a future Queenscliff map sheet volume) by Mel Mitchell of the Heritage Subcommittee of the Victoria Division of the GSA.

(Your best contact to ask about this description would be Susan White on susanqwhite@netspace.net.au)

QN 097
7721-4-3
Mt Pollock, Inverleigh
Large volcanic cone of Late Tertiary to Early Quaternary age with outcrops of scoriaceous and high vesicular basalt near the crest. Immediately to the south of Mt Pollock and adjoining it is a ring of low hills which possibly represent the eroded remnant of an older larger volcanic crater. Melway Map 409 Ref C7.
517681

A date which may relate to the eruption of Mt Pollock's flows is **2.06 million years**, from a sample taken to the south and east of the mount:

2.06
Pollocksford, Geelong
Queenscliff Sheet
38.14 144.19
Aziz-ur- Rahman & McDougall 1972

That would be **late Tertiary age**.

Kathy, the data in your letter below are basically correct, as far as I can see.

A comment you might make make use of is Rosengren's "The significance can be maintained if sufficient open space..." etc. See the web site I give above.

Good luck!

Bernie Joyce.
Associate Professor E. B. Joyce

Volcanoes & Landscape
Heritage, History & Geotourism

Member

UNESCO Working Group on Global Geosites
Member
Working Group on Geomorphosites
International Association of Geomorphologists

Member
Landscape Committee,
National Trust of Australia (Victoria)

Member
Australian Geopark Network Committee

Member
Kanawinka Geopark Board
(Member of Education Committee and Geoconservation/Planning Committee)

Member
Subcommittee for Geological Heritage
Victoria Division
Geological Society of Australia

Former Convener
Standing Committee for Geological Heritage
Geological Society of Australia

Former Chair
Natural Heritage Evaluation Committee - Victoria
Australian Heritage Commission

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www.geology.au.com

Dear Prof Joyce
I was provided your email address by Joane McKnight, Chair, Kanawinka Geopark Board.

She notified me also that she had passed on my queries with respect to Mount Pollock being known in the 'Geological survey of Victoria' Queenscliff sheet (1:250,000), identified as Quaternary 'Newer Volcanics' - 'extrusive theoleiitic to alkaline basalts, minor scoria and ash'. Are you able to confirm or contradict this? My reasons for knowing this information are only to preserve Mt Pollock from major earthworks which will see much of its original endangered vegetation removed. With regard to presenting a window into the past, Mount Pollock still supports significant endangered vegetation. EVC 68:Plains Grassy Woodland, EVC 132_61 Heavier-soils Plains Grassland and EVC 649: Stony Knoll Shrubland are all considered endangered in the Victorian Volcanic Plain bioregion.
The Department of Primary Industries recognises Mt Pollock as significant. I would greatly appreciate your opinion on this matter.
My original query to Joane McKnight is cut & paste below.
I look forward to your response.
Regards
Kathy Russell
Ph: 52656183
165 Mt Pollock Rd
GNARWARRE 3221
-----Original Message-----
From: Kathy Russell [mailto:the.mount@bigpond.com]
Sent: Monday, 23 June 2008 9:59 PM
To: 'Joane McKnight'; 'laseriffic@bigpond.com'
Subject: I think Mt Pollock is defined as 'Newer Volcanics'

Hi Joane
I have been investigating further Mt Pollock. The 'Geological survey of Victoria' Queenscliff sheet (1:250,000), shows the geology of Mt Pollock identified as Quaternary 'Newer Volcanics' - 'extrusive theoleiitic to alkaline basalts, minor scoria and ash'.

I also have hold of a geotechnical report which also identifies the site as Newer Volcanics formation "these volcanic plains across the Western Districts of Victoria to South Australia, in a lava belt approximately 100km wide, with the plains extending in valleys to the north of Ballarat and Melbourne. The volcanic plains are flat to undulating with scattered hills formed by extinct volcanoes, and the site is located within this regional context.

It is expected that the cone location is representative of a 'quietly' erupting volcano formed by 'streams of molten lava flowing down the side of the volcano and across lower plains'. Based on the topography of the site, we expect the site was absent from explosive activity during its formation. These formations formed more steeply sloping hills, and comprise scoria like material observed in 'fire mountain deposits'.

The subsurface profile is expected to comprise shallow surface residual silts, underlain by highly reactive silty clays which grade to variably weathered basalt rock with depth. The depth of bedrock may be variable and numerous discreet floaters and closely packed bolders may be present above the basalt rock interface. Basalt rock is visible outcropping at the surface along ridges and at the hill top.

I also have a cultural heritage assessment for the site which states that Mt Pollock would once have been adjacent to a larger lake that extended from Winchelsea to Camperdown; Lake Corangamite (the largest lake in Victoria), is the remnant of this lake (Hills 1975:314). Two small drainage lines occur within the study area.

Mount Pollock is a large lava dome with extrusive radial lava flows. The lava flows from Mt Pollock blocked the ancestral valley of the Barwon River and restricted the width of the valley between Leigh and Pollocksford. The Department of Primary Industry considers Mount Pollock significant because of this extensive lava formation and regard that the 'significance can be maintained if sufficient open space is reserved around the upper slopes to retain the sense of the place being a volcano' (Dept of Primary Industries website/Mount Pollock).

Thank you
Kathy Russell
Ph: 03 52656183

Sound/Noise Submission

Summary of Attachments

N1 Summary of shortfalls of Officer's report – Kathy Russell

N2 Summary of shortfall's of Marshall Day Report – Kathy Russell

N3 Detailed sound/noise discussion outlining the technicalities of this case – Kathy Russell

N4 Extract from Bald Hills Wind Farm Panel Report – pages 192 – 210

N5 AusWIND 2004 – Marshall Day Acoustics presentation

N6 Toora Wind Farm Review of Noise Monitoring – Graeme E Harding & Assoc, commissioned by South Gippsland Shire Council

N7 Correspondence from Cr David Lewis – South Gippsland Shire Council re Toora report

N8 Bald Hills Acoustical Assessment – Graeme E Harding & Assoc

N9 Toora Site Visit report – Kathy Russell

N10 Correspondence with James Nancarrow, EPA in association with "Amplitude Modulation of Wind Turbine Noise" – Dick Bowdler

N11 Correspondence with Maggie Juniper re misuse of noise, wind speed and operational data by Wind Companies. Spreadsheet offered by Maggie and Letter from Wind Power P/L offered by Kathy

N12 Press Release – Court of Appeal Hearing 24/25 July 2008 – Noise issues were never fairly addressed and the data used to determine the noise levels was never made public.

N13 NZ News article , The Dominion Post – 9 July 2008 – Family to measure wind farm "misery', note that affected resident is 2.5 kilometres from the nearest turbine

N14 Letters of interest relating to 'choppers' and aerodynamic whoomphs

N15 "The Star", 25 July, 2006, South Gippsland – "Enough noise to turn you deaf", featuring Stephen Garito, Toora. Stephen took a settlement and signed a confidentiality agreement in order to move from his premises and get on with his life. No one could enforce the Standards in order to protect him. Stephen is <u>not</u> the dairy farmer I met on my visit.

N16 "Yarram Standard News", 19 July, 2006, South Gippsland – "Wind Farce", featuring Stephen Garito

N17 CV – Neil Gross, recommended independent Acoustics expert for completing background noise testing

Separate Attachment – The Sounds of High Winds, the effect of atmospheric stability on wind turbine sound and microphone noise, by G.P.van den Berg (Don't be put off by its size, it is a very easy read)

Summary of Shortfalls of Officer's Report

First conclusion of Officer's report (sorry that I cannot provide page number reference as there are none)

The proposal…"will meet the relevant Standards for noise…"

Under the heading "Development Plans", Noise:

16. The operation of the wind energy facility must comply with the NZ standard…in relation to any existing dwelling at the date of this permit, to the satisfaction of the Responsible Authority.

17. Within (1) month of commencement…a Post Installation Noise Compliance Test…An independent report summarising the results…must be forwarded to the responsible authority within 45 days. The results must be in plain English and formatted for reading by lay people.

Q: Who will be the Responsible Authority as referenced in these conditions? The EPA is the Statutory Authority with respect to noise and it has its own standard being N3/89 – Control of Noise from Industry in Australia, it does not abide by any NZ standards. Will Sustainability Victoria be the Responsible Authority? They have no jurisdiction over enforcing noise compliance. So is the Responsible Authority the Council? Which ever is the authority, I believe that it should be stated in this report.

Q: An approved planning application for a dwelling exists at 335 Mt Pollock Rd, Buckley, and a previously approved but expired approval exists at 305 Mt Pollock Rd for a dwelling. Why should these property owners be denied the rights afforded to others? A reasonable expectation exists that dwellings will be located at these sites in the near future so therefore they should be afforded the same rights under the noise standards.

Discussion, Assessment, section 3, Amenity of Surrounding Area – Noise:

Summarises objections and discusses work performed by Marshall Day Acoustics

> Officer's report discussion: "In addition to noise affects from wind turbines, a number of objectors raised concerns about the "van den Berg effect". Essentially this is a higher than predicted night-time noise level that was observed from wind farm turbines in Germany and theorized as being due to very stable air conditions at ground level and higher wind speeds at hub height.
>
> The Marshall Day assessment took into account wind speeds at hub height (80m) to eliminate the potential effect of air stability on predicted noise levels ie the van den Berg effect."

Unfortunately, this discussion demonstrates a major lack of understanding of the van den Berg effect by the author, and effectively renders conclusions incorrect. I draw the readers attention to Dr van den Bergs thesis (as supplied) at page 18, section 11.2., In brief, wind velocities at night at turbine level can be substantially higher than at ground level, consequently producing more sound. But in addition to this, is the fact that the sound can take on an impulsive character at night. At some distance from the turbine, this sound characteristic, described as thumping or beating, can be very pronounced, though close to the turbine, this impulsiveness cannot be heard.

The Marshall Day report did not take the van den Berg effect into consideration at all, and for the officer's report to state that they have done so by referencing the wind speeds at hub height is total nonsense and shows a complete lack knowledge on this subject. To say also that the van den Berg effect is merely theorized is another indication of the authors lack of knowledge on this subject. It is very common

throughout the world as well as Australia…Toora, Challicum Hills, Codrington plus NZ)attachment

The Officer's report goes on to state that the EPA which is not a statutory referral authority, did provide informal comment which concluded minimum noise criterion under the standard would be achieved. It also recommended a permit condition requiring a post installation test as well as a general amenity condition should it be necessary to make changes to avoid synchronous operation of different turbines.

I have subsequently had discussions with Mr James Nancarrow from the EPA who agreed that his comments only related to the calculation of the equation based on a logarithm of distance and manufacturers noise specification of the generator component which arrived at the 40dBA calculation, he did not comment on the other parts of the standard which involved background noise testing (used to increased the developers acceptable noise limits in this instance) nor whether the standard would be met with regard to "Special audible Characteristics" clause as included in the standard.

With regard to the background noise testing, this has been found to be inadequate (see Summary of shortfall's of Marshall Day Report, following). And with respect to whether the noise levels would fall under acceptable noise limits as per the standard should the special audible characteristics be present, the answer is a resounding NO. Although James did recommend the inclusion of a general amenity clause, this has been strangely omitted/ not included in the Officer's report. Where is the protection for residents? Again this demonstrates the Officer's lack of knowledge on the subject.

The resulting summary and conclusions are therefore inadequate and flawed.

And that was all that was written by the Officer's on a very complex subject! As can be seen by the amount of evidence I have submitted on this subject that the subject is anything but simple.

The Bald Hills Panel report is extremely detailed in its acoustic analysis of that development (see attachment N4). Dr Van den Berg himself gave evidence at this hearing. The report states unequivocally in the Panel Response & Summary of Findings (page 204) that *Firstly, in relation to assessing whether the Standard can be met, a critical factor is the presence of an unambiguously representative pre development background sample data set. To retain credibility and robustness in any possible instance of complaint or enforcement, where it would be used as a reference, this data must be of good integrity.* It goes on to say that *The absence of such a data set could affect the capacity of either the Fox family of the proponent resolve complaints in the future…It is clearly critical to the integrity of pre-development background noise surveys that they be completed before the commencement of any construction activities.*

This finding is extremely important, because as we found with the dairy farmer at Toora, background noise testing was completed pre construction at Stephen Garito's residence, but not at the Dairy farmer's residence (lets call him Fred). Subsequently, Fred has had modulation issues and complained. The wind company will not concede that there are non-compliance issues because no background assessments were performed pre construction.

And this is the crucial part…because the standard states that acceptable limits are 40dBA or background sound level plus 5dBA which ever is the greater…the wind company can and does say "sorry", who knows if we are complying or not because we don't know what the background noise levels are to be able to add the 5dBA to see if we are over or under! And then as a deterrent to further action they offer to do background noise testing for Fred as long as he provides a mortgage on his property to cover the revenue lost if they turn the turbines off for 6 months to subsequently perform the background testing, because they intend to pursue damages when it is subsequently proven that background noise levels are sufficiently elevated enough to ensure compliance!

But wait, it gets worse…when they perform this background testing, they don't have to provide the wind speed data, nor the corresponding noise measurements to Fred for him to obtain independent assessment of the analysis. This is a common procedure. See attachment N12, where after 4 years, the company finally caved and provided the data which subsequently has proven to be incriminating. Also see attachment N11, which shows how it is common practice to manipulate noise data. At Wonthaggi, Lois Townsend was provided with post construction compliance testing during a period of significantly reduced efficiency – lower efficiency = less noise. Lois also had background monitoring performed which lifted the companies compliance requirements to significantly higher levels than the prescribed 40dBA.

Steve Garito had problems via his background testing also as can be seen by the Toora Wind Farm Review of Noise Monitoring (attachment N6). Many mistakes were (intentionally) made by the developer, and many different assessments were undertaken at the same sites, and the review of procedures concluded on page 15 that "it would appear that robust background sound levels were not established prior to the wind farm operation". This follow up report on Toora shows the folly of expecting that proponents will willingly adhere to both the spirit and the letter of any sort of pre- and post-construction noise management plan. .Stephen Garito didn't have a leg to stand on with regard to dispute resolution. He was getting no where and suffering for it along the way – thus the reason why he (and others) took the payout, signed the confidentiality agreement and moved on.

All but Fred that is. Fred only knows how to do one thing and that is milk cows on his family property. He is still fighting to be heard and spending $30k a year of his own money to do so. His existence is frugal to begin with…no dvd player, no computer, no internet – just the basics. But why should he be displaced because of the greed of others and the piddling amount of electricity the turbines effecting him manage to get accepted into the grid? All he wants is to be able to sleep at night! I'm sorry, but once you meet these people, stand in their homes, listen to the noise they suffer and then deal with the ignorance of the people passing judgement on our objections or placing inadequate conditions on crucial issues such as noise standard enforcement, or making decisions about the proximity of these developments near our homes – it really is difficult to keep ones cool!

Moving on, page 205 of the Bald Hills Panel Report states "if the Shire and indeed the State is to maintain its core value of fairness in the administration of its planning schemes and public confidence in approvals processes for major developments, potential noise complaints in good faith must be given the assurance that somebody is looking after their reasonable interests."

On page 208, the Panel also "highlights the existence of the 5dBA penalty for special audible characteristics under NZS6808. It was not disputed by the proponent that a well drafted planing condition would call this up."

The report also identifies on page 210 that "Municipalities are not likely to possess the budgets or the expertise necessary to monitor or enforce wind farm acoustic conditions. The Department of Sustainability and Environment Planning and Building and/or Regional Services Division do not directly possess the expertise necessary to monitor or enforce wind farm acoustic conditions. The EPA possesses the theoretical expertise to carry out this task but lacks a formal role under the planning scheme or SEPP."

This information is crucial to council developing adequate conditions in order to minimise the exposure likely in the situation where breaches of the standard occur. The risk of special audible characteristics being present at Mt Pollock is great, therefore conditions should be put in place to mitigate risk.

Recommendations

Background noise testing be performed at dwellings and proposed dwellings with previous planning approval within a 3km radius of the wind farm site (see attachment N13 which references noise problems 2.5km from the closes turbine in NZ), with wind speed data provided to residents for the relevant period along with noise recorded data for independent analysis and comment. Background noise testing to include improvements in procedures as identified in the next attachment “Summary of shortfall’s of Marshall Day Report”. In addition to this, new background assessments should be performed at house 19 and 22 to the same standard afforded to other properties undergoing testing.

A night compliance period should be identified for the purposes of NZS6808. Of preference, this should be the night as defined in SEPP – N!. Within the defined night period, the wind energy facility should not exceed the standard more than 10% of the time. This approach should protect the interests of occupants in undisturbed sleep.

In accordance with NZS6808, a 5dBA penalty should apply to noise experienced at sensitive receptors that contain annoying tonal variations and cyclic beats.

For the purpose of meeting any limit pursuant to NZS6808, including the 5dBA penalty limit, the proponent is entitled to seek to demonstrate to the satisfaction of the responsible authority that time or climate responsive acoustic optimisation and/or temporary turbine shutdown regimes can be implemented, before enforcement is commenced seeking the permanent removal of a turbine or turbines.

In this case, the Surf Coast Shire Council will retain the ongoing responsibility for monitoring and enforcing acoustic conditions. The proponent should underwrite the actual cost of a monitoring programme to the satisfaction of the council.

Summary of shortfall's of Marshall Day Report

The Marshall Day report is not reliable or professional enough for determining background noise levels or for facilitating fair compliance with NZS68080, post construction. That is, things not done, overlooked, and just plain sloppy thinking. It would seem the Mt Pollock report was done with cost very firmly in mind.

The following questions are a start to our correspondence with Christophe Delaire from Marshall Day who offered to answer any questions we may have with regard to his report. They were sent over a week ago, and as yet remain unanswered:

Firstly, I refer to the Bald Hills Panel Report. All the usual suspects were there, but, most importantly yourselves (ie Marshall Day).

Clearly, as parties to the Bald Hills Panel Hearings, you would know:

(a) all about the Toora situation via Steve's and Jayne's evidence,

(b) all about the Toora situation via Mr Fowler's evidence,

(c) and one can surely conclude that you would have been very aware of Van den Berg's evidence before the Panel.

(d) You would have been subsequently aware of the Panel's expressed view on the need for caution in the application of the NZ Standard.

Q1. So why did you not provide a considered view of the possibility of the occurrence of the night time temperature inversion in the vicinity of Mt Pollock?

It is very easy to determine the presence or otherwise of the night time temperature inversion, and it's extent, and the speed of winds at ground level and of winds aloft at the same time.

It's called a wind monitoring mast, situated at the neighbour's home (not on the flats with a reduced elevation of 80 metres) , with both anemometers for windspeed and thermometers together at various heights up the mast, able to automatically log the necessary data for as long as is required - with a type 2 sound level meter set up at the base of the mast.

Otherwise, use a tethered met balloon, with instruments, which is let out to various heights.

You have no choice in this matter - it is a requirement as per the standard.

Q2: We live in this environment everyday, we know this phenomenon exists in our area. There are many nights when ground wind speed levels are zero and sound is traveling clearly over great distances. The evidence is there - time to stop ignoring it and time to do something about it. Will you test atmospheric conditions at my home? If not why not?

I have modeled NZS6808 in an excel spreadsheet, and it is interesting to note that when the noise absorption coefficient is reduced to zero (ie during stable noise periods where noise absorption is minimal), the resulting noise levels at our home are 44 dbA...ie not complying with the standard.

NZS6808 section 5.3 with regard to" Special audible characteristics" states:

"Sound from a WTG that has special audible characteristics (clearly audible tones, impulses, or modulation of sound levels) is likely to arouse adverse community response at lower levels than sound without such characteristics."

It goes on to propose a 5 dB penalty to "the measured sound level of the source", ie it has to be 5 dB quieter at the receiver.

Amazingly, although the NZ guidelines were written before Dr van den Berg published his first paper on wind turbine noise, they do make provision for dealing with modulation.

Your report pretends that the van den Berg effect couldn't possibly occur at Mt Pollock, on the basis that it is not, unlike as in Holland, flat terrain. Therefore the report simply ignores the possibility of such modulation as the thumping caused by meteorological conditions. (Toora isn't flat - and nor is Challicum Hills (Ararat) where I could hear the modulation during the day!)

Q3: Do you believe that with the "Special audible characteristics" penalty of 5dbA applied that the Mt Pollock development complies with NZS6808?

The Bald Hills Panel Report goes on to assert that the EPA should be the relevant authority for condition & noise monitoring task. The EPA is the statutory authority. The EPA does coincidently have a noise standard which relates to the control of noise from Industry in Country Victoria N3/89.

Q4: This guideline offers limits for noise from industry during the night time period as 32 dbA. Do you believe that the Mt Pollock development would be able to comply with N3/89 requirements for noise exposure to neighbouring residents?

Not withstanding that the NZS6808 had been endorsed by the Tribunal in the Toora decision, which then led to its wider use in the Victorian planning system...this was prior to evidence arising with respect to the Van den Berg effect.

Notwithstanding also that the Bald Hills report considers only that dwellings within its turbine perimeter would be sensitive to modulation. Our recent expedition to Toora identified one resident not within the boundaries of the turbine perimeter. A resident 1200m from the closest turbine who suffers extreme modulation problems 10 - 15 nights per month. Someone who has been complaining all along, but wasn't able to join forces with Stephen Garito to provide evidence at the Toora hearing. Someone who is still fighting and struggling to be heard. (additional note – we have found more evidence of this in NZ – see attachment N13)

Based on this I believe that NZS6808 is fundamentally flawed and the mechanisms in place to protect residents from abuse of this standard are inadequate.

Atmospheric conditions can wreak havoc with nice clean sound propagation models, especially at night. And as turbines get bigger, their noise can be deceptively hard to predict. Temperature inversions, wind layers and other atmospheric effects can lead to surprisingly distant sound impacts. The noise levels can easily be 15dB louder than predicted.

Noise standards can very easily fail to protect nearby residents from disruptive levels of noise. When standards are exceeded the task of enforcement will quickly out distance the ability of local government and law enforcement. It is crucial that everyone involved (industry, government, residents) resists the easy temptation of relying on "paper" assurances that wind turbines will not create acoustic impacts.

Take Toora again for example. I have the "Toora Wind Farm Review of the Environmental Noise Monitoring Program" by Graeme E Harding & Associates Pty Ltd (attachment N6) which shows the extent to which Stanwell Corporation "performed" noise monitoring exercises, yet manages to wrangle its way out of interpretation of breaches in compliance.

NZS6808 leaves residents no practical recourse should a constructed wind farm appear noisier than predicted. At Toora there was a real need for an independent monitor in relation to its planning permit noise condition. It is equivalently most unfortunate that South Gippsland Shire Council can not enforce noncompliance. Correspondence with Mr David Lewis, Mayor at the time of the Toora proposal and now current councilor, has confirmed that they undertook investigations at the time (as per the report referenced above) but were unable to follow through due to the cost of legal challenge (attachment N7).

Stanwell Corporation (Toora) maintains to date the lack of pre-development background noise surveys for comparison against current noise emissions as the reason for compliance. It is clearly critical that these surveys be completed correctly before the commencement of any construction activities. The absence of such a data set could affect the capacity of residents to resolve complaints in the future.

Q5: Do you agree that background data sets of good integrity from a location on the property of residents with specific concerns is crucial? ie all houses within a 3km radius of the closest turbine. Without this information, these residents do not have a leg to stand on with regard to noise complaints in the future.

With regard to background noise monitoring at Mt Pollock,

Section 4.0 The monitoring should have been performed in the middle of winter, at least or as well as in November, in order to determine whether there is likely to be any affects due to the occurrence of atmospheric stability or any other possible sources of modulation (the so-called "van den Berg" effect).

Q6: Your response to this?

The EL-215 noise loggers are not sensitive enough to properly measure background noise in quiet rural locations.

Q7: You should know this. What is your response to this?

Section 3.1 is absolute rubbish. Do you see any potential contradictions between what is said in this section about the difficulties of dealing with a stable atmosphere, and what you had to say in a presentation which can be found at:
www.marshallday.com/downloads/Wind_farm_noise_in_Australia_(C)_Marshall_Day_Acoustics_2004.pdf (see attachment N5)

Q8: What is your response to this?

Daily rainfall data collected by the Bureau of Meteorology at Hamilton was reviewed and where rainfall is likely to have occurred, these data points were removed from the analysis.(Page 6)

Q9: Hamilton airport is 230km from the Mt Pollock site! The Bureau of Meteorology at Geelong is 30km away. Which would seem more appropriate to use? I question the integrity of your background noise survey. Maybe this report is word for word the same as Oaklands (Glenthompson) perhaps and you forgot to change all of the relevant locations?

Background noise monitoring equipment was placed within bushes on our property.

Q10: Is this appropriate placement as per the standard?

The noise monitoring tower was constructed on the flats at 80m above sea level. The peak of Mt Pollock is situated 180m above sea level. The Bald Hills report identified that during stable atmospheric conditions, the reference height wind speed at 10m AGL on the turbine site typically used for noise modeling (Marshall Day) would be substantially exceeded at hub

height. In practical terms, this would mean that whilst the ground level receptor would have low to no wind and then typically a very low natural background noise level, the turbine blades would be capturing large amounts of wind energy and generating significant noise emissions thereby. The wind profile in such circumstances was different to that of the normally used logarithmic model, that was accepted as valid for daytime purposes.

Q11: How can noise readings from our property be matched with relevant wind speed data supposedly provided by Future Energy when the monitoring mast was at least 4km from our home with an approximate 80m error in elevation measurement? Again, I question the validity of our background sound testing.

In addition to this, it is a well known issue that high shear creates problems with not only power curves, but also turbulence.

The basic assumption is that the hub-height wind speed represents the average wind speed across the rotor disc. This assumption is not bad for normal shear, no trees and no steep inclinations. For high shear and a zero-displacement the nonlinearity becomes important. Nonlinearity causes deviation from the basic assumption that hub height measurement is representative of average. The contribution to turbulence from trees, forests and hills should be added to the ambient turbulence and the turbulence created by wakes.

This change in shear factor and resultant turbulence is what gives rise to the "chopper" effect. Helicopters are not called "choppers" for no valid reason. Their blades are spinning fast creating turbulent air which causes the "chopping" noise heard/felt at low frequency from great distances (see attachments N10 and N14). As previously mentioned, such circumstances are different to that of the normally used logarithmic model as mentioned in the Bald Hills Panel Report and "Special audible characteristics" of NZS6808.

I understand you will choose to claim the RePower MM92 turbine is capable of optimisation to "significantly" reduce noise when compared with other comparable models. The Toora turbines are also capable of optimisation, the fact is they choose not to exercise this function due the loss of productivity and therefore money. This claim is not relevant in these circumstances where I am questioning the understatement of noise in your assessment under normal operating capacity.

Q12: The wind monitoring tower should have been placed on top of Mt Pollock to correctly monitor & model wind behavior taking into consideration the additional 80m in height and the effect of the dramatic inclination of Mt Pollock rising from the plains. A mast height only just reaching the height of the base of the WTG assessed closest to my home is useless don't you think? A better assessment of noise would have taken into consideration the effects of this turbulence don't you think?

There are Duty of Care considerations applicable and Ethics considerations applicable, etc, when one provides professional advice on a fee for service basis. I believe that the issues I have raised here are very serious and that your attention to providing answers to these questions in writing requires utmost urgency. I think the message here is crystal clear..."Houston, we have a problem.

The AusWIND 2004 powerpoint presentation referenced at attachment N5 offers some interesting information not considered in the Mt Pollock report…

“A major wind farm project with a capacity in excess of 30MW will normally be the subject of an Environmental Effects Statement”

Mt Pollock development is 14 x 2.1MW = 29.4 MW – just missed out on the need ned to prepare an ESS by 1 turbine – what a surprise!

"Preparing and presenting an ESS to a panel can be an extremely long and expensive exercise for the wind farm developer"

So we can see why Future Energy were determined to keep this development just under 30 MW.

"At low wind speeds (5-8m/s) wind farms may have the most impact because the difference between background levels and wind farm noise may be at its highest."

"Measure background noise levels and correlate against wind speed at 10m above ground level."

The windies often make the assumption that the 10 metre wind measured at the monitoring mast (down on the flats in our instance and a fair distance away from any affected residence) is the same in both speed and direction at the residence. Most often it isn't, but it is simply convenient for them to assume so. That's the first source of a major error. Then, often they do not even measure windspeed at 10 metres at the monitoring mast. They simply assume the minimum shear and extrapolate some value from (say) the 50 metre or 60 metre height at which they measure their nearest value for hub height windspeed. Generally they are only interested in the hub height value, so they don't even bother to measure a 10 metre value. This is a fairly crucial point. The 10m at ground level needs to be measured at the residence as well as the site of the turbines.

Marshall Day should have collected wind data at the residence simultaneously with any noise monitoring. And of course at any other noise monitoring site. And that wind data should be done using, as a minimum, a 10-metre mast measuring windspeed and direction at, say 1.2 metres as well as at 10 metres. And away from vegetation, as I have already pointed out

.

There should be 10-metre measurements (windspeed and direction) taken on the non-mast at the Mt Pollock site simultaneously with any noise monitoring at resident's sites.

"Regression analysis is used to fit a curve through measurements. This method is used to standardise what can be a large set of data, and provide consistency between analyses."

The power point presentation shows how the regression curve can be fit to a set of data points from low to high level noise environments. Notice the spread of data points in the power point presentation graphs (ie all the dot points), now compare this with the spread of data points on page 8 and 9 of the Marshall Day reports. See how scattered they are. James Nancarrow from the EPA picked this point up for me commenting that there was a non uniform distribution of the data which would create an error in determining the line of best fit. Establishing an incorrect line of best fit means an error in determining final background noise plus 5dBA which becomes the new limit for which the wind company can abide by. Mr Nancarrow suggested that there was something wrong with the data for it to be spread so far…possibly attributable to the noise monitoring equipment being placed in the bushes.

"NZS6808 also details a simple method of predicting noise levels at various distances from the turbines. This simple method only predicts noise levels based on the attenuation due to distance and air."

"The method was always considered conservative as it ignored any ground absorption and topographical shielding. As the turbines have grown in size the method is no longer conservative as the low frequency noise content is greater and the model under predicts"

This is significant! This is Marshall Day identifying that the noise logarithm attached to NZS6808 is not conservative and that this model UNDER PREDICTS!

This is contrary to the conclusions drawn in the Mt Pollock report and subsequently contrary to the conclusions drawn in the Officer's report and goes a long way to proving both reports very inappropriate for decision making purposes.

"An assessment of noise impact must look at the period of time that the turbines will be audible and the presence or otherwise of acoustic anomalies"

These anomalies include synchronous addition of turbine noise as well as incidence of stable air. When the incidence of stable air at a site exceeds 10% the need for conservative noise modeling becomes important. How can Marshall Day determine if the incidence of stable air exceeds 10% or not if they haven't tested for it.

Recommendations

If the development proceeds , I recommend that a new wind monitoring mast be erected at equivalent elevation and closest to turbine location on top of Mt Pollock as represents the highest turbines that represent the greatest noise risk (in the vicinity of turbines 10,9,8or 12), in order to determine wind direction behavior (ie turbulence), effect on velocity at this location , temperature measurement and more accurate 10m wind speed data for the site.

In addition to this, 10m mast should also be erected at residential sites in order to correctly monitor wind speed & direction as well as temperature patterns in order to determine the likely presence of the van den Berg effect.

Background noise monitoring should be carried for all residences and proposed dwellings with previous planning approvals within a 3km radius of the site prior to the commencement of construction, taking into consideration the errors made previously.

Wind speed data, temperature readings and noise data should be provide for independent analysis by the resident if they so choose.

Reasonable grounds for dispute resolution with respect to background testing need to be formulated prior to background levels being accepted and prior to commencement of construction.

Detailed sound/noise discussion outlining the technicalities of this case

Why do South Australia and NSW use a set of guidelines where the noise baseline level
is set at 35 dB(A), whereas Victoria is left high and dry at 40+ dB(A)?

Why does it seem to be the case that there is much better protection in NSW statewide under what is called the INP - the Industrial Noise Policy - than in rural Victoria?

The curve showing wind shear with height is modelled by a mathematical formula, much like we use a parabola to fit the acceleration due to gravity.

Assuming a hub height is that 80 metres, and presume a 90 metre rotor
diameter, (45 metre radius), and work out the windspeeds at the top and bottom of the rotor,
ie at 125 metres and 35 metres for each m value(shear value).
For m = 0.14,
U(35) = 9 x (3.5)^0.14 = 10.73 metres per sec
U(125) = 9 x (12.5)^0.14 = 12.82 metres pre sec
For m = 0.25
U(35) = 9 x (3.5)^0.25 = 12.31 metres per sec
U(125) = 9 x (12.5)^0.25 = 16.92 metres per sec.

You can see that in the case of m = 0.25, the wind shear across the
rotor (the difference in top and bottom velocities), is much larger.
This is a BAD thing if you are a wind farmer trying to harvest the
maximum power, but it is also a REALLY BAD thing if you are a neighbour, because greater shear across the rotor, from whatever cause, causes more noise (back to my "chopper" analogy) - and this is the so-called "van den Berg" effect.

There are lots of things that can cause increased shear - stable air at ground level, caused by the night time temperature inversion so common in inland locations, particularly in winter, is the most common - and can occur over terrain that has not a tree in
sight. Steep inclinations, trees and other turbines also cause turbulence or “shear”.

To complicate things a bit – the presence of trees also reduces the wind speed overall (say, at 10 metres, it is now instead, 7 metres per sec), which reduces all the values above, thus further reducing power output to begin with, but the increased shear remains to cause the problems.

In terms of mediating noise issues, wind operators will talk about turbine optimization mode which means effectively that they feather the blades or the rotors. They are a variable-pitch, constant-speed design. The idea is that, above the cut-in wind speed, the rotor turns at constant speed while generating electricity. At the higher wind speeds within the operational wind speed range, the pitch of the blades is altered so

that the increased energy available at the higher speeds can be used to produce greater electrical output, but allowing the propeller to continue to rotate at constant rpm. Operating at constant speed simplifies the requirement for frequency control. The output has to be AC (alternating current and voltage) at 50 Hz, or 50 cycles per sec. This frequency depends absolutely on the speed of rotation of the propeller. Any deviations and the wind turbine may not connect to the grid.

When the wind is blowing at above a safe speed, or for any other reason, the blade pitch can be changed to what is called a "feathered" position where the turbine draws very little energy from the wind and if it is rotating there is the lowest interaction with the airstream.

Presumably this mode is quieter, but I would have thought that the simplest thing to do would be to apply the disc brake and stop rotation all together. But, I'm not a wind engineer…

Why do we refer to helicopters as "choppers"?

The answer is also simple: because of the sound they so often make.

The "chop" is the result of exactly the same mechanism that produces the wind turbine "thump" - the passage of the rotor through turbulent air, or air passing at "differential wind velocities across the rotor", ie wind shear.

The next nearest-sized rotor to that of a wind turbine is that of a helicopter - and their "thumps" (they are "chops" for the smaller rotor) are a well-known source of complaint by residents living close to, for example, busy hospital heliports.

Have a look at the publication: "

Principles of Helicopter Aerodynamics

By J. Gordon Leishman
Just Google search on the title. The book comes up as the first entry. A lot of the book can be read on-line. See Chapter 13 for starters, and then scroll through other chapters for the explanation of some of the terms.

It may be heavy going, but it backs van den Berg’s hypothesis to the hilt!
In science one often needs to come at things from another direction.

Shadow Flicker

I think that a shadow length of 1 km may not be conservative enough. We found specific evidence of shadow flicker in the main street of Toora, approx 2.5km from the relevant turbine. Yes we did record this evidence on video incase you are interested. Australia generally is a place of bright sunshine - shadows are therefore in contrast very dark. Flicker considered only for windows into rooms on houses is really not acceptable - many people in rural areas expect to work outside without shadow annoyance. If shadows impact their properties - that's unacceptable.

The guidelines are vague in their requirement of not more than 30hrs flicker at a dwelling. Future Energy is taking this to the extreme by interpreting it to mean 30hrs only through the window of a dwelling.

The study by Richard Bolton 'Evaluation of Supplemental Environmental Shadow Flicker Analysis for "Cohocton Wind Power Project"' at: http://www.barehillsoftware.com/Shadow%20Flicker%20Analysis%20of%20UPC%20Wind%20_Cohocton_%20SDEIS_2a,%20RBolton.pdf

reveals the assumptions routinely used in software such as Wind Pro and ReSoft. He states "Wind Pro is not an impartial and unbiased software model, and is apparently designed to aid wind turbine siting. This is inappropriate for engineering software which should be based only on scientific principles with no editorializing." Earlier in the study, he makes what would seem to be the reasonable point that: "In rural settings homes are often located on large parcels and in the fair-weather seasons home owners will frequently use their property outdoors for recreation and work – lawn mowing, car washing, picnics, relaxing etc.

"So in these conditions, which are also the sunniest, the presence of blade flicker anywhere within a reasonable view shed of a residence *must be considered an environmental nuisance and must be mitigated.* Wind turbine blade shadows are not a mere shadow being cast because they will often be moving and creating a highly objectionable nuisance. Also 130m high turbines on elevated hill ridges will cast distinct shadows for thousands of metres, well above any vegetative screening.

"The definition fails to include all flicker effects such as night-time flicker conditions as with moon shine [sic]. Rural residents experience very dark skies and on moon lit nights the night-scape can be very dramatic and enjoyable to the residents. Blade flicker nuisance from a rising or setting moon will be an environmental detriment and must be evaluated along with sun-shine effects.

"Other flicker annoyance may be present as well such as with a picturesque sunset that expands well along the horizon. Brightly lit from behind, though not casting shadows, the flickering blade movement of turbines on the horizon will likely cause visual disturbance

to the views cape and must be evaluated, particularly when linear strings of turbines are sited causing wide-angle disruptions."

In contrast to this seemingly reasonable requirement of nuisance evaluation, the design of software such as Wind Pro is deliberately restricted to the evaluation of flicker nuisance occurring in the room of a home, and nowhere else. Further, the assumption is made that the nuisance in that room is caused solely by the direct casting of a shadow across a window into that room, and not for example “a reflection”. All other sources of annoyance, including the blight on outside enjoyment of the property, are excluded by Wind Pro's analysis.

This so called expert report is lacking in substantiation. The Garrard Hassan report for Black Springs in NSW is virtually word for word the same as our Mt Pollock report, with the changes necessary for the different location, of course.

Micro Siting variances and final placement of turbine #14 due to unresolved electromagnetic interference issues with the license arrangement for the Telstra tower leave house 22 in a precarious situation with regard to shadow flicker potential in excess of 30 hours. Under current siting conditions, assessment for their property does not identify the extent of hours shadow flicker will influence their out door enjoyment, it only identifies hours exposed through an uncovered window. Same for house 21. No evaluation of shadow flicker has been made. An informed decision cannot be made on shadow flicker based on the Garrard Hassan report or the Officer’s report as they stand. We require that a new assessment be made taking into consideration the above mentioned shortfalls.