
are only likely to be affected if a wind farm is in the line of sight between two sending and receiving antennae or within a zone of the line of sight of these antennae.

Where a potential exists for interference to line of sight links, an obstruction analysis can be undertaken to ensure that no part of a wind turbine assembly will enter the Fresnel Zone of the microwave link. The maximum extent of the Fresnel zone occurs at the midpoint along the path of the microwave link.

6.3 RADIO COMMUNICATION LINKS

EPURON identified and mapped all point to point communication links existing in the vicinity of the proposed wind farm site at the time of writing to establish the line of sight paths. Figure 10 provides details of the location of fixed microwave links crossing the site. (Based on data contained in the ACMA RADCOM database, April 2010.)

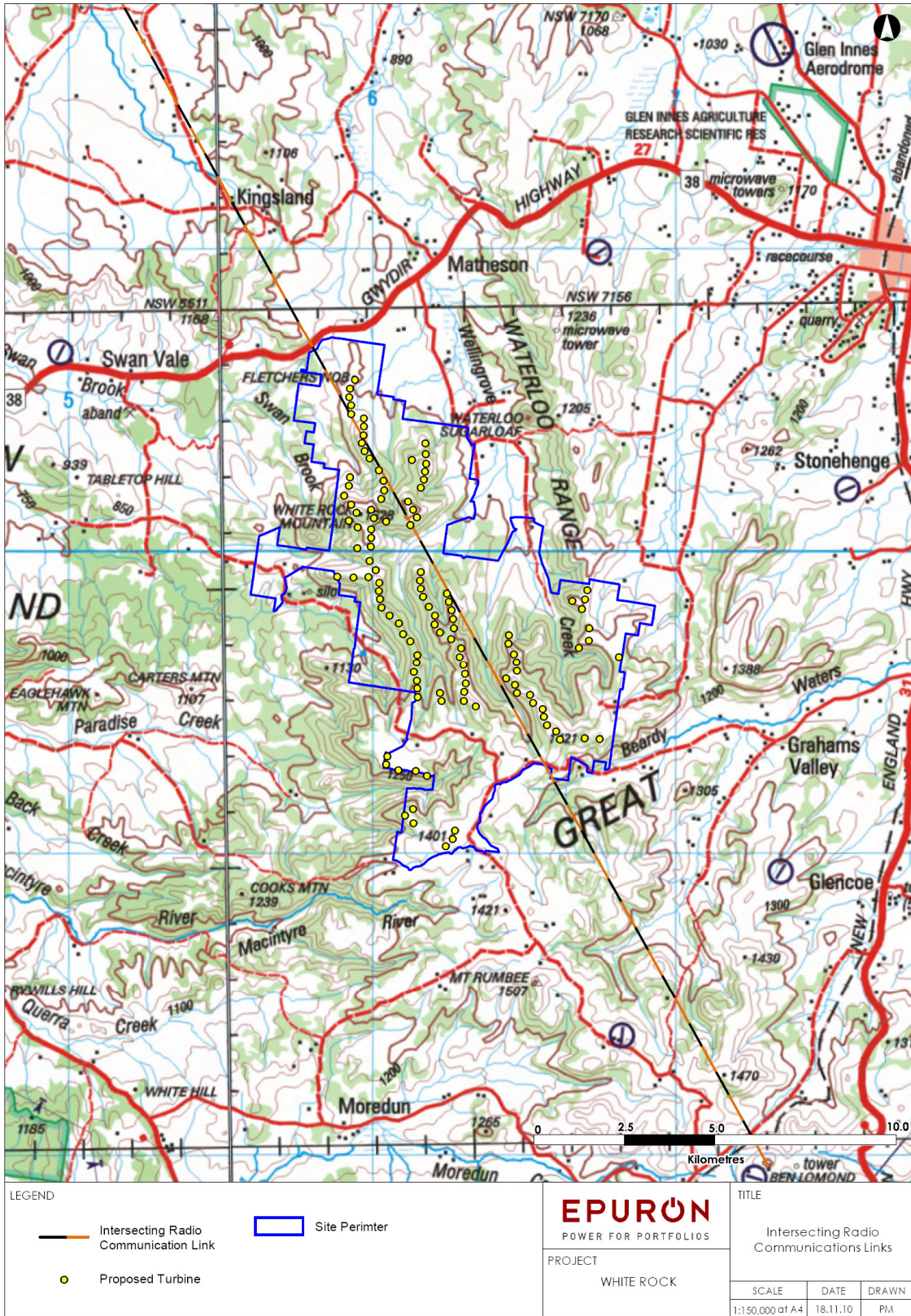


Figure 10 - Point to point radio links in the vicinity of the White Rock wind farm site (original turbine layout)

MAP ID	LINK ID	ACCESS ID	FREQUENCY	CLIENT NO	LICENSEE	Length (m)
1	174412	1252330	42710000	12138	TransGrid	119100
	174412	1252329	44710000	12138	TransGrid	119100

Figure 11 - Licensee list

In order to ensure that obstruction to the signal transmission path does not occur; calculations of the 2nd Fresnel zone of the point to point communications link crossing the site were undertaken.

It is suggested that beyond the 2nd Fresnel zone, the power of a scattered signal from a structure such as a wind turbine would be small enough such that it would not result in significant interference at the receiver.²⁴

Completion of an obstruction analysis showed that a number of turbines were located within the 2nd Fresnel zone or close to the direct line of sight path of the point to point link crossing the site.

Accordingly, Mr. Michael Freeburn from TransGrid, the corresponding link license holder, was notified and provided with details of the White Rock wind farm proposal for assessment on 10-8-10. At the time of writing, a response from TransGrid had not been received by EPURON.

Research of recent literature suggests that interference to VHF links (i.e. in the 30MHz - 300MHz frequency range) by wind turbines is not likely. The TransGrid link crossing the site operates with a frequency of 42.7MHz and so falls within this range.

Auswind best practice guidelines states: *“The communications systems most likely to be affected (by wind turbines) are those which operate at super high frequencies (particularly microwave systems operating at frequencies above 300MHz)”*

Garrad Hassan’s “Assessment of Electromagnetic Issues for the proposed Berrybank Wind Farm”, insists that only frequencies greater than UHF range (300MHz - 3GHz) may potentially experience interference from wind turbines.²⁵

The same view was also taken by Energreen Wind Pty Ltd in their Black Springs Wind Farm EMI assessment dated 26-7-2006:

“UHF and VHF voice services have been found not to be affected by wind turbines unless the turbines are in the immediate vicinity of an antenna such that “near field” issues occur. The Blayney wind farm, south west of Sydney, NSW lies directly in the path of a VHF link and there has reportedly been no discernable interference as a result of the development.”²⁶

Therefore, based on:

- The results of the above literature research,
- A high level, preliminary assessment and verbal advice from Garrad Hassan in relation to the TransGrid link (pers. comments Sherrin Yeo 20-8-10),
- The frequency of the link being in the low VHF range (30MHz - 300MHz) and
- The fact that the wind farm is not in the vicinity of an antenna,

24 D. F. Bacon, A Proposed Method for Establishing an Exclusion Zone around a Terrestrial Fixed Link outside of which a Wind Turbine will cause Negligible Degradation of the Radio Link, Radiocommunications Agency UK Report Ver 1.1, 28 Oct 2002

25 http://www.unionfenosa.com.au/BB_Application_Report/BB_Appendix_9_Telecommunications_Assessment.pdf (page 3/23)

26 <http://majorprojects.planning.nsw.gov.au/files/1887/Appendix%20G%20Electromagnetic%20interference%20study.pdf>

Interference to the existing point to point communication link from the White Rock wind farm is not expected.

EPURON previously contacted all organisations identified as operating radio communication licences (including fixed link communications) within 25km of the Cullerin Range wind farm proposal, which is now operational and without communications issues in the area.

Each license holder was asked to provide independent comment on the wind farm development with respect to possible impacts to communication links. At that time, no organisation within the 25km radius raised concerns.

Optus, Vodafone and Telstra provided general guidelines to assist in the planning of wind farm.

In response to these enquiries, the following comments were noted,

"Provided wind turbines are located well outside the 2nd Fresnel zone of the point to point microwave links, no interference to communications is expected" (pers. comm. Mr. Trong Ho, Optus Mobile)²⁷

"Clearance criteria is the same for all carriers. Please use the same criteria as proposed by Optus" (pers. comm. Mr. Ganesh Ganeswaran, Senior Engineer / Transmission, AAP Communications Services 22/11/05)²⁸

"Provided wind turbines are greater than 100m away from Mobile tower (or in the case of directional panel antennae) not in direct line of sight for panel antennas, wind turbines will have minimal effect on existing coverage." (pers. comm. Mr. Ivan D'Amico, Area Team Manager (Country) - NSW&ACT, Telstra Services, Wireless Access Solutions, Mobile Coverage Delivery)²⁹

The above suggestions have been considered in the planning of the White Rock wind farm proposal.

6.4 OTHER RADIO COMMUNICATION

6.4.1 Two way mobile

A small number of mobile bases exist in the area surrounding the wind farm site. These bases potentially provide cover to mobiles in a 360 degree arc from their bases. No significant impact from the wind farm on base coverage beyond normal mobile operational performance is predicted in view of the geographic separation between the base antennas and the turbine structures. Of course a mobile unit communicating with a base station when the mobile is located within metres of the wind turbine structures (or indeed near any large building, silo, tower etc) may experience some very local performance change, however moving a short distance would restore performance to normal.³⁰

6.4.2 CB radio

CB radios are not individually licensed, the equipment being subject to class licensing only. Therefore, no records of location or operators of CB radios exist, and the channels are shared without any right of protection from interference. No impact from the wind farm is predicted

²⁷ Taurus Energy - Cullerin Range Wind Farm Environmental Assessment Report 2006

²⁸ Ibid.

²⁹ Ibid.

³⁰ Lawrence Derrick & Associates Bannister Wind Farm – Investigation of possible impacts on broadcasting and Radio communication Services September 2003

except perhaps for very local effects to portable or mobile units in the immediate vicinity of the turbines which could be avoided by a small location change of the unit.³¹

6.4.3 Wireless broadband

From studies in other areas such as Mahinerangi, NZ³² it is concluded that the minimum separation required between wind turbines and mobile broadband transmitters is approximately 240m. Turbines will be located outside this distance to avoid any impacts on mobile broadband services where possible.

6.5 MITIGATION MEASURES

As a result of the exclusion zones established in planning the wind farm, the possibility of impacts to existing point to point communication links is reduced. However, in the unlikely event that interference is observed, the proponent is confident that impacts will be able to be mitigated using the following techniques:

- Modifications to or relocation of the existing antennae
- Installation of a directional antennae to reroute the existing signal
- Installation of an amplifier to boost the signal and/or
- Utilisation of onsite optical cable to reroute the original signal.

7 ELECTRIC AND MAGNETIC FIELDS

7.1 WHAT ARE ELECTRIC AND MAGNETIC FIELDS?

The existence of electric and magnetic fields (EMFs) has been recognised since electricity was discovered, and their characteristics have been the subject of thousands of scientific studies around the world. Research conducted over the past 25 years has significantly enhanced our knowledge of EMFs.

Electric fields are produced every time a voltage exists across a conductor. The higher the voltage, the stronger the electric field. Electric fields are strongest closest to the conductor and their level reduces quickly with distance. Most materials act as a shield or barrier to electric fields. The level of electric fields is measured in thousands of volts per metre (kV/m).

Magnetic fields are produced by the flow of an electric current through a conductor. The higher the current, the greater the magnetic field. The strength of magnetic fields is measured in milliGauss (mG). Like electric fields, magnetic fields are highest closest to the conductor and their level reduces quickly with distance. Most materials will not act as a shield or barrier to magnetic fields.

7.2 WHEN DO ELECTRIC AND MAGNETIC FIELDS OCCUR?

Electric and magnetic fields (EMFs) occur both naturally and from man made sources and are not unique to high voltage power lines.

³¹ Ibid.

³² Mahinerangi Wind Farm Compatibility with radio services April 2007 - Kordia

Natural EMFs are associated with such things as lightning, solar activity or the earth’s magnetic field. All living organisms, including humans, have natural electric charges, currents, electric and magnetic fields.

Man made EMFs occur whenever electricity is being used in any form of electrical equipment or wiring. Most people will be exposed to a wide variety of EMF sources throughout their daily lives.

As electricity use is so widespread in modern society, questions about its possible effects on health are important to everyone.

Biological and occupational health research on EMFs began in the early 1960s. Since that time many national and international review panels, such as the World Health Organisation, the US National Institute of Environmental and Health Sciences and the UK National Radiological Protection Board have evaluated the research to assess the likelihood of health effects being associated with exposure to electric and magnetic fields. In Australia, the relevant health authority is the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), an arm of the Commonwealth Department of Health. In response to a recent report, the CEO of this agency said:

“It is also important not to fixate on the location of external power lines, including high voltage transmission lines, as the prime cause of exposure. Exposure to ELF magnetic fields can arise from ground currents, internal household wiring and the use of electrical appliances as much as from exposure to external powerlines.”

Government Agencies such as ARPANSA have also monitored international research on the topic, concluding that,

“On balance, the scientific evidence does not indicate that exposure to EMF’s found around the home, the office or near power lines is a hazard to human health”³³

7.3 WHAT ARE THE ELECTROMAGNETIC FIELD IMPLICATIONS OF WIND FARMING?

There are four potential sources of EMF associated with wind farming. These are:

- The grid interconnection power line
- The wind turbine generators
- Any electrical transformers
- The underground collector network cabling

The interconnection with the existing grid is usually made above ground and is no different from any other power line used in the network. The EMF levels are comparable to typical household appliances i.e. negligible.

The electrical generator windings are close together and surrounded by conductive metal housing so the electromagnetic fields are effectively zero.

33 <http://www.transgrid.com.au/she/swp/Documents/EMF%20Brochure.pdf>

The switchyard transformer, which will carry the entire output of the wind farm, is generally located in the central part of the switchyard and the protective fencing means it is not possible for members of the public to come close enough to be exposed to appreciable EMF.

The collector network, which connects the various turbine generators of a wind farm operates at typical distribution voltages and is buried at least 750mm below ground level. Because of the closeness of the phase conductors within the cables and the screening of the cables, the electromagnetic fields are balanced out to be effectively zero.

The electromagnetic fields associated with generation and export of electricity from a wind farm does not pose a significant threat to public health. Consequently, no serious or adverse EMF or interference issues are anticipated from a wind farm.³⁴

7.4 MITIGATION MEASURES

No mitigation measures are required.

8 CONCLUSION

Conflicts between point to point radio systems and the wind turbines are not expected. Also, mobile radio and other radio communication services in the area are not expected to be impacted by the wind farm or its operation.

Analogue TV transmission is currently planned to be phased out by 2013 and replaced by digital. Digital TV is not susceptible to visible “ghosting” degradation. Any impact of reflections from the turbines would be a minor reduction of coverage at the limit of the service area.

For any confirmed wind farm interference problems where TV antenna system improvements are unsuccessful, the use of the digital TV services in the area may be the best solution, requiring the provision of a digital set top converter.

Interference to MF and FM sound broadcasting is not expected.

Overseas experience indicates that electrical interference from wind farm generators and controls is not a problem with established and reputable wind turbine manufacturers and therefore no electrical noise measurements are warranted.

Obstacle lighting is not expected to be a requirement at this site.

A detailed site assessment of the most sensible option in relation crop dusting and top dressing would need to be made by the involved landowner and the proponent with the advice of appropriately licensed contractors once the project has been completed.

9 TURBINE CO-ORDINATES

WTG_ID	Easting	Northing	WTG_ID	Easting	Northing
WRK_002	367453.73	6693821.45	WRK_065	360165.8	6698737
WRK_003	367103.67	6697103.65	WRK_066	360061.4	6699431
WRK_004	367115.43	6697506.42	WRK_067	361694.9	6703606

³⁴ <http://www.wind.appstate.edu/reports/BP10 EMC&EMF.pdf>

WRK_005	366016.9	6694075.5
WRK_006	365568.24	6694818.52
WRK_007	365617.81	6694558
WRK_008	365710.01	6694282.5
WRK_009	366143.71	6693813.49
WRK_010	365149.51	6695285
WRK_011	364716.4	6695348
WRK_012	361627.81	6698554.44
WRK_013	361818.4	6698224.5
WRK_014	366558.27	6698404.99
WRK_015	366869.1	6698144.49
WRK_016	363005.3	6695983.5
WRK_017	363030.1	6695660.5
WRK_018	364654.6	6695615.5
WRK_019	362954.21	6696286.5
WRK_020	362879.61	6696840.5
WRK_021	362828.5	6696559.5
WRK_022	364715	6696372
WRK_023	364727.11	6696087.5
WRK_024	363365.51	6694909
WRK_025	362981.91	6695387
WRK_027	362597.41	6690520.99
WRK_028	362373.01	6690279.49
WRK_029	362545.59	6697147.06
WRK_030	362644.8	6697511.26
WRK_031	362612.4	6697809.5
WRK_032	362412.8	6698644.5
WRK_033	362470.02	6698378.16
WRK_034	362560.7	6698099.84
WRK_035	362184.94	6695344.47
WRK_036	362238.02	6695084.85
WRK_037	362002.83	6697628.33
WRK_038	362176.39	6697368.52
WRK_039	361547.85	6699356.53
WRK_040	361525.05	6699085.42
WRK_041	361551.85	6698813.93
WRK_042	361753.6	6692602.92
WRK_043	361382.31	6692764.5
WRK_044	361427.83	6696617.21
WRK_046	361404.69	6696366.07
WRK_047	361291.1	6691510.49
WRK_048	361030.87	6691290.99
WRK_049	361311.31	6691034.5
WRK_050	361440.1	6695212.5
WRK_051	361422.49	6695759.05
WRK_053	361319.96	6696045.64
WRK_054	360956.11	6697318.42
WRK_055	361201.76	6697069.21

WRK_068	361718	6703255
WRK_069	361686.4	6702678
WRK_070	361725.1	6702938
WRK_071	361645.2	6702414
WRK_072	361545.3	6702150
WRK_073	361127	6701687
WRK_074	361423.4	6701163
WRK_075	361205.9	6700913
WRK_076	361286.8	6701426
WRK_077	361250.5	6703057
WRK_078	360319.3	6702379
WRK_080	359908.5	6701419
WRK_081	360345.4	6702053
WRK_082	360235.7	6701775
WRK_083	359905.8	6700772
WRK_084	359992.8	6701137
WRK_085	359907.6	6700489
WRK_086	359863.1	6699736
WRK_087	359898.7	6700199
WRK_089	360166.3	6702721
WRK_090	359600.1	6703621
WRK_091	359685.8	6703353
WRK_092	359665.2	6704433
WRK_093	359663.8	6704162
WRK_094	359658	6703876
WRK_095	359246.8	6704867
WRK_096	359202.9	6702484
WRK_097	359169.5	6702205
WRK_098	359422.4	6701317
WRK_099	359468.8	6700831
WRK_100	359176.4	6701055
WRK_101	359252.7	6701580
WRK_102	359455.5	6700147
WRK_103	359376.9	6705707
WRK_104	359186.2	6705126
WRK_105	359242.5	6704577
WRK_106	362683.3	6690796
WRK_107	359210.1	6705405
WRK_108	359852.6	6703104
WRK_109	359023.6	6701878
WRK_110	361431.3	6695495
WRK_111	362968.9	6695085
WRK_112	366959.2	6693853
WRK_114	367053.1	6698762
WRK_115	366767.4	6696860
WRK_116	365255.7	6695022
WRK_117	364364.6	6695828
WRK_118	362014.9	6697924

WRK_056	360825.43	6697676.98
WRK_057	360436.61	6693254
WRK_058	360405.3	6692983.5
WRK_059	360809.61	6692793.5
WRK_060	360248.1	6698186.99
WRK_061	360512.86	6697920.1
WRK_062	360200.51	6698467.5
WRK_063	359822.21	6699192.5
WRK_064	360174.81	6699010

WRK_119	366975.6	6698466
WRK_120	360404.6	6701025
WRK_122	364441.9	6697003
WRK_123	364626.5	6696645
WRK_124	364458.6	6697276
WRK_125	368091.1	6696553
WRK_135	359318.8	6699188
WRK_136	358792.3	6699215

10 FRESNEL ZONE CALCULATION

Link ID 174412 - Licence 1251917 Link length 119100m

d1 (m)	d2 (m)	Frequency (MHz)	Fresnel Zone (2nd) metres
0	119100	42.7	0
10000	109100	42.7	358.7717031
20000	99100	42.7	483.5680871
30000	89100	42.7	561.5717939
40000	79100	42.7	610.9758501
50000	69100	42.7	638.4543243
60000	59100	42.7	646.8076869
70000	49100	42.7	636.7890297
80000	39100	42.7	607.4900641
90000	29100	42.7	555.8704097
100000	19100	42.7	474.7035621
110000	9100	42.7	343.6551413
119100	0	42.7	0



11 CORRESPONDENCE

From: SULLIVAN, BYRON [mailto:BYRON.SULLIVAN@casa.gov.au]
Sent: Tuesday, 17 August 2010 8:38 AM
To: Anthony Micallef
Subject: White Rock Wind Farm near Glen Innes NSW. [SEC=UNCLASSIFIED]

Anthony,

Thank you for your e-mail and attached letter dated 13 August 2010.

2. At this time, CASA has no specific authority to direct action relating to structures, including Wind Farms, located away from aerodromes. You should undertake the following consultation to assess the potential hazard posed to aviation by the proposed development.

2.1. Identify any aerodrome within 30 km of the boundaries of the proposed wind farm and consult with the aerodrome operator to determine any impact on Obstacle Limitation Surfaces at such aerodromes. Penetration of these surfaces is likely to pose a hazard to normal aviation operations at the aerodrome.

2.2. Consult with Airservices Australia (02 6268 4111 - Ms Michelle Bennetts) to have them assess any potential impact on instrument approach procedures at aerodromes, navigational aids, communications facilities or surveillance facilities.

2.3. Contact the Aerial Agriculture Association of Australia (02 6241 2100 - Mr Phil Hurst) to advise him of the proposal and gain comment on the potential hazards to aerial application and related operations in the area.

3. You advise that the maximum height reached by the turbine blades is likely to be up to 150 m. Aircraft are permitted to fly as low as 500 ft, which is equivalent to 152 m. This being only 2 m above the height reached by the proposed turbine blades, and allowing for probable tolerances in aircraft altitude, the proposed turbines are likely to be a hazard to aircraft traversing the area. It is recommended that you consider your duty of care in deciding whether or not the wind farm should be obstacle lit or other wise marked.

4. The location, extent and height of the wind farm is to be advised to:
Aeronautical Data Officer
RAAF AIS (VBM-M2)
Victoria Barracks
St Kilda Road, Southbank, VIC, 3006
E-mail: ais.charting@defence.gov.au

Thank you for your interest in Aviation Safety.

Byron N SULLIVAN.
Aerodrome Engineer - (Aerodrome Lighting)
Airways and Aerodromes Branch

From: TRIPCONY, Bill [mailto:BTripcony@ambulance.nsw.gov.au]
Sent: Thursday, 19 August 2010 11:27 AM
To: Anthony Micallef
Subject: RE: White Rock Wind Farm - Ambulance Service of NSW

Anthony,

The wind farm as proposed will not interfere with Ambulance Service radio communications.

Bill Tripcony
Telecommunications Manager

9320 7830

-----Original Message-----

From: Greg Williams (<mailto:gwilliams@nbntv.com.au>)
Sent: Friday, 20 August 2010 1:26 PM
To: Anthony Micallef
Cc: gbird@nbntv.com.au
Subject: Emailing: Dowe to Glen Innes Path.pdf

Hi Anthony,

Thank you for contacting us in regards to the proposed White Rock wind farm.

As we discussed, we are concerned that there will be significant impact on the television reception in Glen Innes.

The translator site at Carpenters Hill receives its input signal from the parent site at Mt Dowe (ACMA site ID 35653). As shown in the attached pdf it passes through the area proposed for the wind farm. While our CSIRO data is based on scattering interference caused by wind turbines much closer than 25km I believe that you need to take this possible interference into account as it has the potential to disrupt commercial television reception to the whole town of Glen Innes, not just individual viewers.

We need to identify these issues before any construction starts because the remedy, if required, will take several months to implement.

The broadcasters concerned are NBN, Southern Cross Broadcasting (Macquarie Southern Cross Media) and Prime.

Regards,
Greg

Greg Williams
Broadcast Engineering Manager
NBN Television
11 - 17 Mosbri Cres
Newcastle 2300
02 4929 2933
0428 503 678
gwilliams@nbntv.com.au

From: HONG John [mailto:John_HONG@rta.nsw.gov.au]
Sent: Monday, 23 August 2010 5:48 PM
To: Anthony Micallef
Cc: COOK Ron (IM&IT)
Subject: RE: White Rock Wind Farm - Roads and Traffic Authority

Anthony,

I have no concern of your proposed wind farm project, as this would generate insignificant noise impacts to the RTA radio communication services in the Glen Innes vicinity.

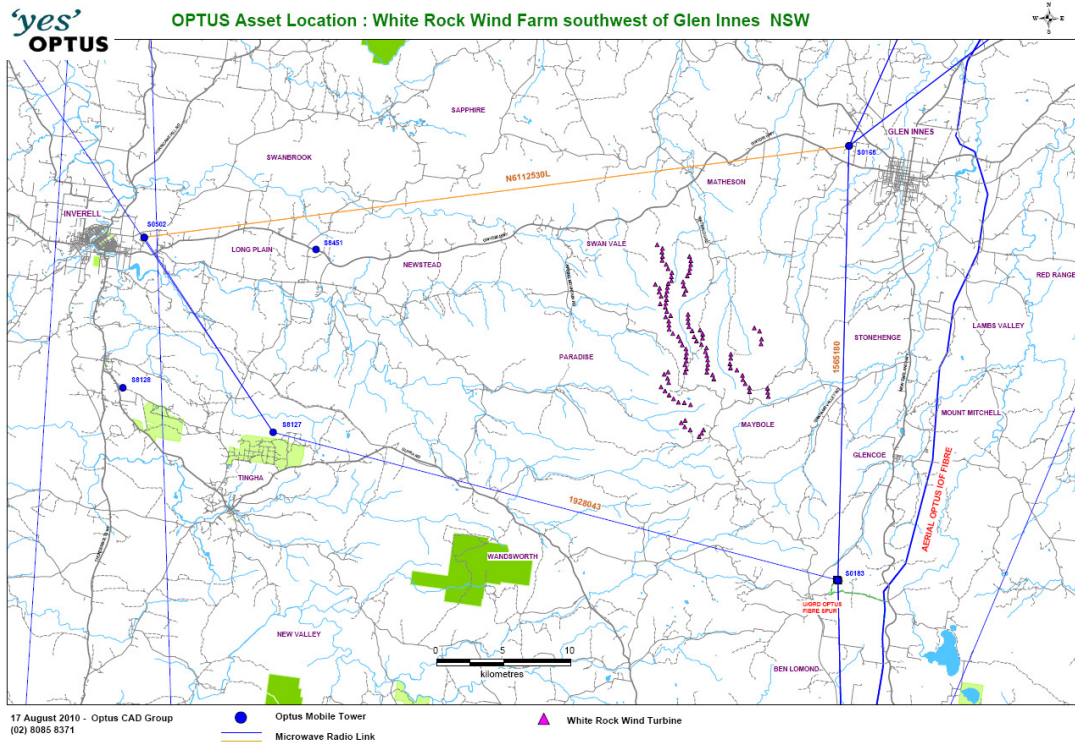
Regards
John Hong
Radio System Manager
Transport Management Centre
25 garden St,
Eveleigh NSW 2015
tel: 83961626

From: Jayantha Wickramasinghe [<mailto:Jayantha.Wickramasinghe@optus.com.au>]
Sent: Tuesday, 24 August 2010 9:53 AM
To: Anthony Micallef
Cc: Trong Ho; Maxi Victoria
Subject: RE: White Rock Wind Farm - Singtel Optus

Dear Anthony

The proposed White Rock wind farm development has no impact on existing or planned Optus network infrastructure.

Regards
Jayantha



From: David Boundy [mailto:david.superair@inet.net.au]
Sent: Tuesday, 24 August 2010 10:23 AM
To: Anthony Micallef
Cc: 'Carol @ Superair'
Subject: WIND TURBINES

Anthony hi,

Following is a response to the letter dated 16 August 2010 from you in relation to the proposed White Rock wind farm. There are 2two letters, one from us putting our position forward and one that was submitted by the Aerial Agricultural Association of Australia to the General Purpose Standing Committee which is still relevant. If you have any questions of either response please don't hesitate to call.

Regards David

24-08-2010

EPURON
Level 11, 75 Miller st
North Sydney,NSW,2060
Ph 02 8456 7400
Fax 02 9922 6645
Attention;- Anthony Micallef

Dear Anthony

Superair Australia’s position on the proposed wind farm is that we “OBJECT”, unless measures are put into place to allay our concerns regarding what we feel could be negative impacts on our business.

Firstly some background, I am presently the manager of Superair Australia which was established in 1964 in Armidale. Since then we have grown to become the largest aerial topdressing company in Australia. We have bases in Glen Innes, Armidale, Tamworth, and Scone. We employ 22 local staff which comprises aircraft engineers, commercial pilots, truck drivers and administration persons. We operate a fleet of over 10 aircraft and loader trucks.

These wind farms will become a huge obstacle in performing our main occupation as an aerial topdressing company. These wind turbine structures are approximately 110 metres above ground level. As you may or may not be aware we carry out our flying operations between 20-30 metres above ground. The problems that we face would be quite apparent from these figures.

We have a hard time coming to grips with the fact that these towers will decrease our safety margins, which may ultimately lead to a negative effect on our turnover. This could contribute to a loss in local jobs. I hope I am proven to be wrong.

Until the towers are in place we do not know from a safety aspect or quality of work that if in fact we will be able to continue aerial fertilizing in these areas as we have done for the previous 44 years. The Ben Lomond and Glen Innes area contribute a large amount of monies to our turnover and to lose this through no fault of our own is going to make it a lot harder for survival in a high overhead profession and business that we operate.

There are other wind farms in Australia and aerial agricultural operations take place near them. The problem is that these wind towers are erected in a totally different topographical location, be it, altitude, topography, local wind strength, local wind shear, dwellings, airstrip locations, and several other factors dictate the ability to carry out low level aerial operations safely and cost effectively.

Therefore each proposed wind farm has to be treated on a case by case basis and not just from an overall view of how interested parties such as the aerial agricultural industry are considered in the overall planning and assessment of the proposal.

I have had meetings with the developers of the wind farms, mostly positive at the time. What I find frustrating is that each couple of years the developers seem to change through company restructuring or takeovers from another company. Any agreement we may have had seems to fall by the wayside and we start over again from the beginning. Also I am not sure how legally binding any agreement is between the parties.

The following is an extract from previous correspondence that I have sent to our aerial fertilizer clients that will be affected by having wind turbines erected on their properties or adjoining landholders that are affected as well. It explains in some detail the problems that we will and may encounter once the wind turbines are erected.

As I have said before, we can not foresee all problems that may be encountered with something that you can not see at the present moment and have to try and visualise, as well as all the variables that we try to deal with in our present operation, being mainly the weather & terrain.

What I can say though, and this is definite, is that these wind turbines will – (this applies to both the property with the towers as well as the adjoining properties without towers)

- Decrease our safety
- Decrease our productivity
- Decrease accuracy of the fertiliser deposits
- Decrease productivity of the pastures to the landholder
- Increase costs to the landholder
- Decrease our revenue

I will try to expand on the points I have raised –

- **Decreased Safety** – the average height that we fly to aerial top dress pastures is between 20-30metres. These towers are in the vicinity of 110 metres in height. Therefore the safety aspect is self explanatory.
- **Decreased productivity** – when we carry out the aerial operation we attempt to fly a grid pattern in straight lines. The flight lines, directions & spacings, are influenced by the
 - a) Safe operation of aircraft
 - b) Topography
 - c) Layout of the property or the section being treated
 - d) Co-efficient of variation of the deposition pattern
 - e) Weather conditions existing at the time

If any or all of the factors influence too heavy on safety or productivity, we may not be able to carry out the aerial topdressing at all. A set of towers will effectively change the topography. They will also change our line directions causing a decrease in productivity (eg. Shorter runs, more turns). To enable productivity to be as high as possible we carry as much pay load as is safe to do so. If we have to climb an extra 100 metres or greater, our pay load will have to be decreased, therefore causing a decrease in productivity. This cost would have to be borne by the landowner in increased charges. One major factor that would not be measurable until the towers are in place is the turbulence generated by the structures. If this

was too great, the operation may have to cease. Another decrease in productivity, whereas before it would have not been a problem.

- **Decreased accuracy of fertiliser deposits** – commonly referred to as co-efficient of variation. We as pilots fly anywhere between 20-30 meters depending on several factors – safety, topography, size of treatment area & shape of treatment area. If we have to fly at 110 metres or greater, we can not accurately determine or would not give guarantees as to the accuracy of fertiliser deposits on to the property, or that we would even maintain them within the boundaries at all times. I would feel that there would be areas that we could not treat at all.
- **Decreased productivity to the landowners** – because of the accuracy being compromised and sections of land not being able to be treated properly, the growth rate of pastures would be effected, therefore decreasing productivity on that property
- **Increased cost to landholders** – there will be an increased cost to landholders because of the explained above. This could be anywhere from \$5 per hectare, bearing in mind if we are able to do the job at all.
- **Decreased Revenue** – what I can see but hope it would not happen is that because of our decreased accuracy, some of our landholders may look to get fertiliser applied by different means eg. Ground spreading. This means our income would be directly affected and properties that we have traditionally done for many years we would lose to alternative application methods.

These towers are a massive obstacle to our operation. We, as agricultural topdressing pilots, already have a high concentration level with the associated risks that we presently deal with. These towers will add another dimension to our occupation, which I can honestly say we would not welcome for obvious reasons. .

I am only too happy to offer an insight into our operations and complexities that do not exist in another form of commercial flying operations in the world. I would offer to take anyone interested for a simulated topdressing flight in our aircraft at a time & place convenient to both parties. It may be only then that a somewhat minor understanding of what our occupation entails would be achieved by the developers of these wind turbines, and then they may realise the adverse effects on our business.

“If the following suggestions could be agreed too with developers before construction occurs, then it would go a long way to alleviating our concerns about the whole wind farm development in our operational areas.”

Increased flying time & costs

Where a surcharge for additional flying time for aerial operations is incurred by a landowner with wind turbines located on his/her land due to the presence of those turbines, the developer shall meet the full cost of this surcharge. This may include adjoining properties with not wind turbines on that land, but proximity of the turbines causes flight path changes to complete aerial operations

The surcharge shall be calculated by the aerial operation as a fair charge for additional flying time.

The developer or the controlling body shall pay the surcharge directly to the aerial operator upon receipt of an invoice and sufficient information to justify the surcharge.

It is believed that a fair surcharge rate per hectare per property, independent of weather conditions, could be negotiated in Year 1 & 2 and applied to each subsequent aerial operation to save detailed cost justification of every operation on each property. This agreement would have to last the natural life of the wind turbines.

Decreased accuracy of fertiliser spreading

It is understood that a decrease in fertiliser spreading accuracy is likely to only occur over a proportion of the properties being considered for wind farm development, depending upon the configuration and proximity of turbines. Specifically fertiliser spreading accuracy along property boundaries appears to be the most critical issue, avoiding fertiliser application on the neighbours land.

In response to this, the following is proposed:

An additional 5-10% of fertiliser by volume will be purchased by the developer or controlling body for each fertiliser spreading operation on each property that is likely to incur spreading inaccuracy along a property boundary or adjoining property boundaries. With the additional flying time incurred to spread this additional amount of fertiliser, the associated cost will be met by the developer or controlling body.

Those properties where spreading inaccuracy is likely to occur along a boundary will be identified in the first application of Aerial operations after the turbines are in place. This agreement would have to last the natural life of the wind turbines.

Decreased Revenue

If we were to lose traditional customers to alternative means of fertiliser application, eg:- (ground spreading operations). We would like to see a clause in the development consent or approval that, “ IF ANY PARTIES ARE ADVERSLY AFFECTED AND MAY LOOSE REVENUE THROUGH CONSTRUCTION OF A WIND FARM, EVEN THOUGH

THEY MAY NOT BE THE LAND OWNER, THAT THERE A PROCESS OR AGREEMENT DOCUMENTED FOR COMPENSATION TO THESE BUSINESSES.”. This would have to last the natural life of the wind turbines.

To sum up, I can see our business being adversely affected through no fault of our own by these wind turbines. All I am asking for is a fair outcome for us or any other parties that may be affected as well. I can be contacted on any of the numbers listed at any time if there are any questions that anyone may have. If we all communicate and address the problems that we have raised I can only see positives coming out of these types of developments.

Kind regards David Boundy.
Manager Superair Australia

**AERIAL AGRICULTURAL
ASSOCIATION OF AUSTRALIA
LTD.**
ABN 13 002 501 886 • ACN 002 501 886

21 August 2009
The Director
General Purpose Standing Committee Number 5
Parliament House
Macquarie Street
Sydney NSW 2000
By email: gpscno@parliament.nsw.gov.au

Dear Director

AAAA Submission to Inquiry into Rural Windfarms

The Aerial Agricultural Association of Australia (AAAA) represents Australia’s aerial application industry, including crop protection spraying, fertilizer application and firebombing.

Aerial application is heavily regulated by the Civil Aviation Safety Authority and pilots and operators are licenced to at least Commercial Pilots Licence standard and undergo ongoing professional development conducted by AAAA.

AAAA works closely with CASA and industry members on safety promotion, training, regulatory development and identifying emerging threats to aviation safety and appropriate responses.

A key emerging threat to aviation safety both in Australia and overseas is developing windfarm infrastructure. In particular, wind monitoring towers are a critical threat to low level aviation safety.

There are two quite distinct issues arising from windfarms that affect aerial application:

- safety of the aircraft and pilot and
- economic impact on aerial applicators.

Safety Impacts

AAAA view is that the case of *Sheather v Country Energy* (NSW Court of Appeal) clearly established that anyone with infrastructure posing a threat to aviation must consider the risks that infrastructure poses to aviation safety and respond appropriately through marking or 2 other measures to safeguard aviation operations. This precedent is of critical relevance to windfarm developers.

There are also a range of activities currently underway that are important to the consideration of the impact of windfarms and potential directions for the future. These include:

- Commonwealth’s Aviation White Paper (Department of Infrastructure etc)
- Commonwealth Inquiry into Safeguards for Airports and the communities around them (Department of Infrastructure etc)
- CASA consultancy on safety implications of tall structures not in the vicinity of airports
- Relatively recent review and release of the Australian Standard AS3891 - Air Navigation - Cables and their supporting structures - Marking and safety requirements AAAA has made submissions to each of these processes and has consistently raised the need for appropriate risk management of windfarms and wind monitoring towers in an aviation context.

For example, the AAAA submission to the Commonwealth Government’s Aviation White paper included the following recommendation:

- Establish and fund a national database of powerlines, wind monitoring and power generation towers and other obstacles so as to address this significant threat to lowlevel aviation. Despite the best efforts of AAAA, such information is not made available from any power companies and most wind farm developers.

This proposal is expanded on in the attached recent submission to the Commonwealth Government on Safeguards for Airports which is at **Attachment A**.

AAAA has done a lot of work to make it easier to mark guy wires and powerlines – including on wind monitoring towers – through amendment of the national standard on marking of wires so as to use a new marker developed by Country Energy with the cooperation of AAAA.

There is now little practical reason why wind towers and especially wind monitoring towers should not to be marked at least. In addition, AAAA has attempted to provide relevant information to any developer through the Wind Energy Association, but this process is voluntary and consequently will not provide coverage of all developers.

AAAA also passes on information to members that has been provided to it by wind farm developers on the physical location of wind monitoring towers. However, only a few developers provide this information and again there is little doubt that many towers are going up unmarked and unknown until hopefully spotted by pilots during pre-application inspections.

More comprehensive safeguards must include a national system of communication the position of all wind monitoring towers and the inclusion of this on a national database accessible by low level pilots. This is a very real issue for topdressing and firebombing operations, as wind monitoring increases, so does the threat to legal aviation activities.

Economic Impacts

Safety is not the only consideration that is imposing additional risk and consequences on the aerial application industry.

The placement of wind farms in areas of highly productive agricultural land is leading to reductions in treatment areas of aerial application companies with no compensation for this externalization of costs by wind farm developers.

For example, placement of a wind farm may affect flight lines and application height or even whether the application can be conducted at all - leading directly to either an increase in cost or a reduction in income - and sometimes both - for aerial application operators.

AAAA's submission to the Commonwealth Inquiry into Safeguards at Airports (Attachment A) makes a number of points regarding land planning issues that are equally relevant to the development of wind farms regardless of whether they are near airports or in agricultural land that may be treated by air.

In particular, AAAA is concerned that not enough consideration is being given through the State planning processes to the impacts of windfarms on productive agricultural land and the aerial application industry, remembering that it may not only be the land footprint where the windfarm is sited, but also land surrounding that for some kilometers where aircraft may have to maneuver to conduct aerial application.

At the very least, windfarm developers should be required to pay compensation to aerial applicators where it can be reasonable established that there will be an economic impact imposed on the aerial application company by the wind farm developer.

Further information

If you require any further information or would like AAAA to expand on or further explain any of the issues raised in this submission, please do not hesitate to contact the Association's CEO, Mr Phil Hurst on 02 6241 2100 or email: phil@acrialag.com.au

Yours sincerely

Phil Hurst
CEO - AAAA

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From: Britto Tam [mailto:tam1bri@police.nsw.gov.au]

Sent: Wednesday, 25 August 2010 12:45 PM

To: Anthony Micallef

Cc: Palitha Kuruppuarachchi

Subject: [Update] Fw: Radio Impact Assessment for proposed White Rock wind Farm site and NSW Police services

Hi Anthony,

NSW Police Force would like to inform you that, after conducting radio impact assessment on its licensed radio services at ACMA site ID #6909 - Pacific Grid Site Trig Point Ben Lomond, the proposed White Rock wind farm location (with coordinates and boundary as indicated in your email dated 23-August-2010) would not affect our (NSW Police Radiocommunications) services.

Kind Regards,

Britto Tam
NSW Police Force

Tel: 02-9265-4702
Fax: 02-9285-3710
Email: tam1bri@police.nsw.gov.au

From: Stephen Carter [mailto:fas@stjohn.org.au]

Sent: Monday, 6 September 2010 11:11 AM

To: Anthony Micallef

Subject: Proposed White Rock Wind Farm

Hello Anthony,

In reply to you letter dated 16 August 2010 regarding the proposed White Rock wind farm and its potential impact on site 306347 (Wilson Park, Taylor Street, Glen Innes).

My apologies for the tardy reply – one of the people I needed to consult with has been unavailable over the last couple of weeks.

We do not believe that the proposed wind farm development will have an adverse impact on this site for the purposes of St John Ambulance Australia.

Please do not hesitate to contact me if you require additional information and/or clarification.

Cheers, Stephen



Councils Ref: VM:kw:DW:269809
Your Ref: Anthony Micallef

Epuron Pty Ltd
Level 11
75 Miller Street
NORTH SYDNEY NSW 2060

3 September 2010

Dear Sir

RE: WHITE ROCK WIND FARM SITE – GLEN INNES

Council acknowledges receipt of your letter on 18 August 2010.

Council advises that it does not foresee any affects to radio communication services arising from the proposed wind farm development. However, Council may review this advice upon confirmation of the actual location of the development.

Council presumes that you have also contacted other radio communication users such as the Rural Fire Service to seek their views.

As such, we look forward to future communications with you when a final determination has been made with regard to the location for the wind farm.

Should you wish to discuss this matter further, please do not hesitate to contact Council on (02) 6730 2350.

Yours sincerely

Vanessa Menzie
Director of Engineering Services.



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