Wind Turbine Noise

Why Does it Annoy?

Not just the decibels
Week 1
Week 3
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Week 14
Week 16
Week 17
Week 18
Weeks 19 to 24
Week 26
Week 32
Week 33
Why is this man ill?

Possibility 1 – He has Wind Turbine Syndrome brought about by excessive infrasound.

- Infrasound is well below the threshold of perception.
- Salt says infrasound affects people at levels below the threshold of perception. Work on tonal noise with animals.

Not A-weighted
Why is this man ill?

Possibility 2 – The noise is too loud

- Very quiet rural areas
- When house is downwind, turbines above background most of the time.
- Sometimes as much as 20dB above background.
Why is this man ill?

Possibility 2 – The noise is not masked and sometimes thumping.

Masking – Road Traffic
Wind in Trees
Turbines thumping

A-weighted
Amplitude Modulation

• Germany/Netherlands – Frits van den Berg 2003
  – Thumping impulsive sound increases annoyance

• Netherlands – Vos dose response

• Finland – di Napoli and Siponen research

• Ontario have 5dB penalty for AM from WTG

• NSW Guidelines refer to it

• Lee in South Korea – research into dose response
Why is this man ill?

Possibility 3 – Perception

- the amount of annoyance was hardly related to the objective sound level
- Wolsink et al in 1993 in their study of annoyance from wind turbines.
- It is almost universally recognised that noise exposure level never accounts for more than a small proportion of the variance of any outcome variable considered.
- Flindell and Stallen 1998
- The results from the laboratory experiment confirm that the unfairness of the sound management procedure influences the evaluation of the sound.
- Maris 2008
Perception

• People in rural communities perceive that
  – Their lives will be blighted by the development
  – They gain no benefit
  – They pay subsidies in the form of Tax
  – They pay more for electricity.
  – Developers make all the money

• People don’t feel they are being treated fairly.
• Turbine noise has got a bad name

• Fields 1993 – Aircraft Noise
  • Perceived predictability;
  • Perceived control;
  • Trust and recognition;
  • Voice; (are you listened to)
  • Personal benefits;
  • Compensation;
  • Sensitivity to noise;
  • Home ownership;
  • Accessibility to information;
  • Understanding; Is information relevant and correct.
Why is the man ill?

- Perceived predictability;
- Perceived control;
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- Voice; (are you listened to)
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- Understanding; Is information relevant and correct.

In terms of Fields list:

- He feels he has no control. He phones the Council but they can’t do anything and the wind farm operator won’t call back.
- He doesn’t trust the wind farm operator – why was everything done so secretively without contacting him? Why did they appear while he was out to put up equipment.
- He has no voice. It just seems the Council think he is a nuisance because he pesters them.
- He gets no benefit from this at all.
- Nobody has given him any information. The Council don’t know anything and the wind farm operator doesn’t tell him anything.
- He doesn’t understand the report and nobody has explained it to him.
My conclusion is . .

• In many cases the noise is too loud – particularly if it is accompanied by modulation.
• But a major factor is that development noise is badly managed at the application stage and badly managed if there are complaints.
• It's not Wind Turbine Syndrome

Last time I did a paper saying that ……..

• It's a howler! It made my day!
• I'm not certain (so please don't quote me, and don't get your hopes up), but it may have set a new benchmark in breathtaking incompetence coupled with boldly stated absurdity. In some places, it teeters on the knife-edge of slapstick. Brilliant! A tour de force!
• Best wishes,
  • Calvin Luther Martin, PhD
The Effect of Bad Noise Management in the Past

• What was a number of isolated problem cases in the early days has lead to even the most benign application for a turbine receiving multiple objections.
• Bad management doesn’t just affect your project but future ones.
  – Objectors say it’s a mysterious effect of infrasound
  – Developers say they are a load of cranks
  – Governments say we have strict noise limits in place so there can’t be a problem
  – Objectors become incensed because they believe their concerns are treated with contempt
  – Developers say objectors are exaggerating

  – And so on and so on

  – *The fact that sound level is not predicting annoyance does not mean that people are “not really annoyed” when they are reporting it.* Wolsink et al 1993
  – It has to be accepted by industry and by governments that there is an issue here. Unless it is properly managed it will get worse. That does nobody any good.
Summary

• Governments and developers must accept that the level and character of wind farm noise is sometimes just not acceptable to reasonable people particularly in rural areas.

• More effort should be made to ensure a development really will have a low noise impact – not just tick boxes.

• More effort should be made to manage the issue properly. Involve communities from the beginning and genuinely listen to their concerns and act on them where possible.

• The fight against climate change is exactly the sort of thing that should bring communities together.

• Exactly the opposite is happening.