

A photograph of a wind farm at dusk or dawn. The sky is a mix of blue, purple, and pink, with some clouds. In the foreground, several large white wind turbines are visible, their blades slightly blurred. The ground is dark and appears to be a field. In the background, there are more turbines and some distant hills or mountains. The text "WINDFARM NOISE" is overlaid in the center in a bold, blue, sans-serif font.

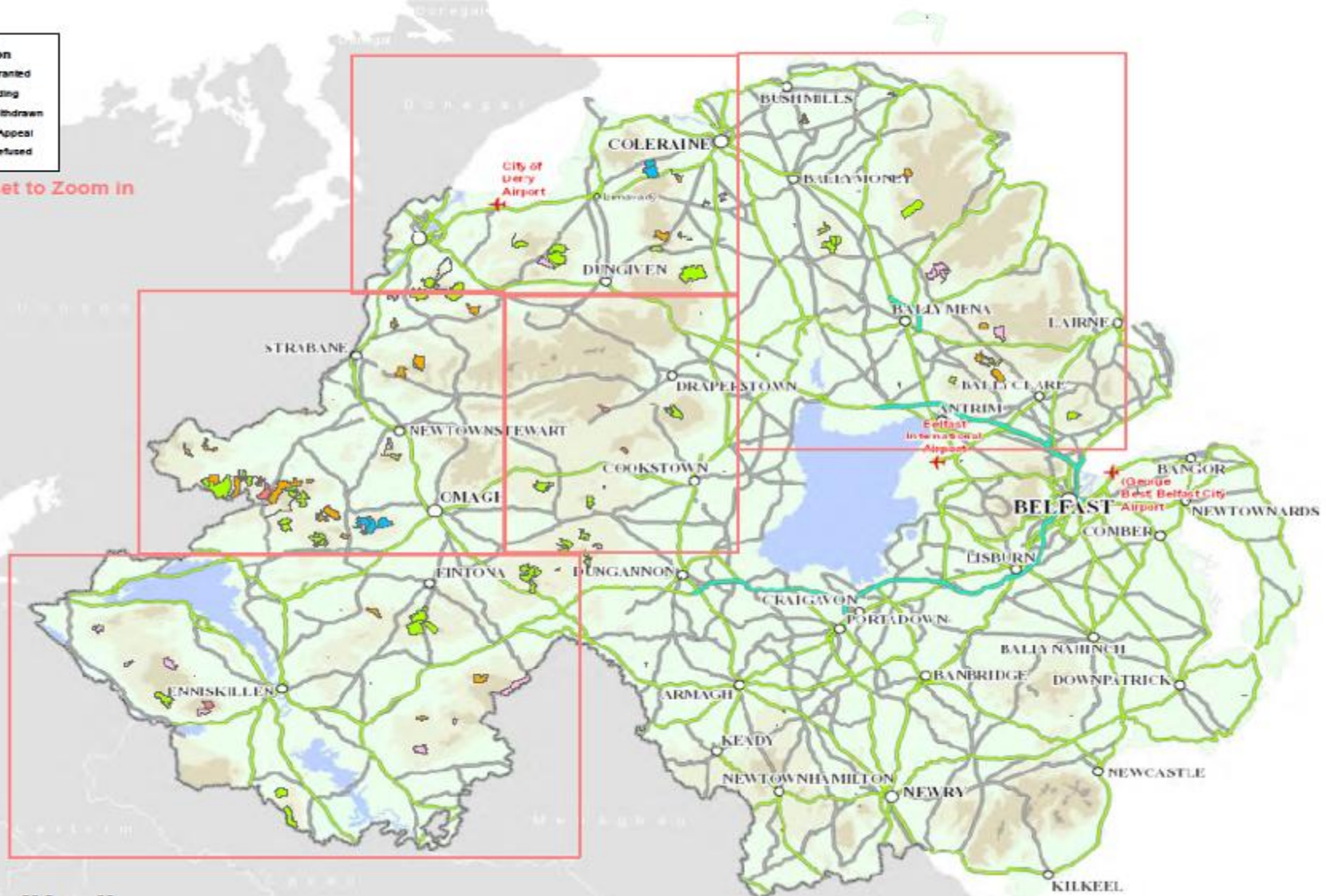
WINDFARM NOISE

Planning Applications for Wind Farms April 2000 - February 2013

Planning Decision

- Permission Granted
- Decision Pending
- Application Withdrawn
- Approved on Appeal
- Permission Refused

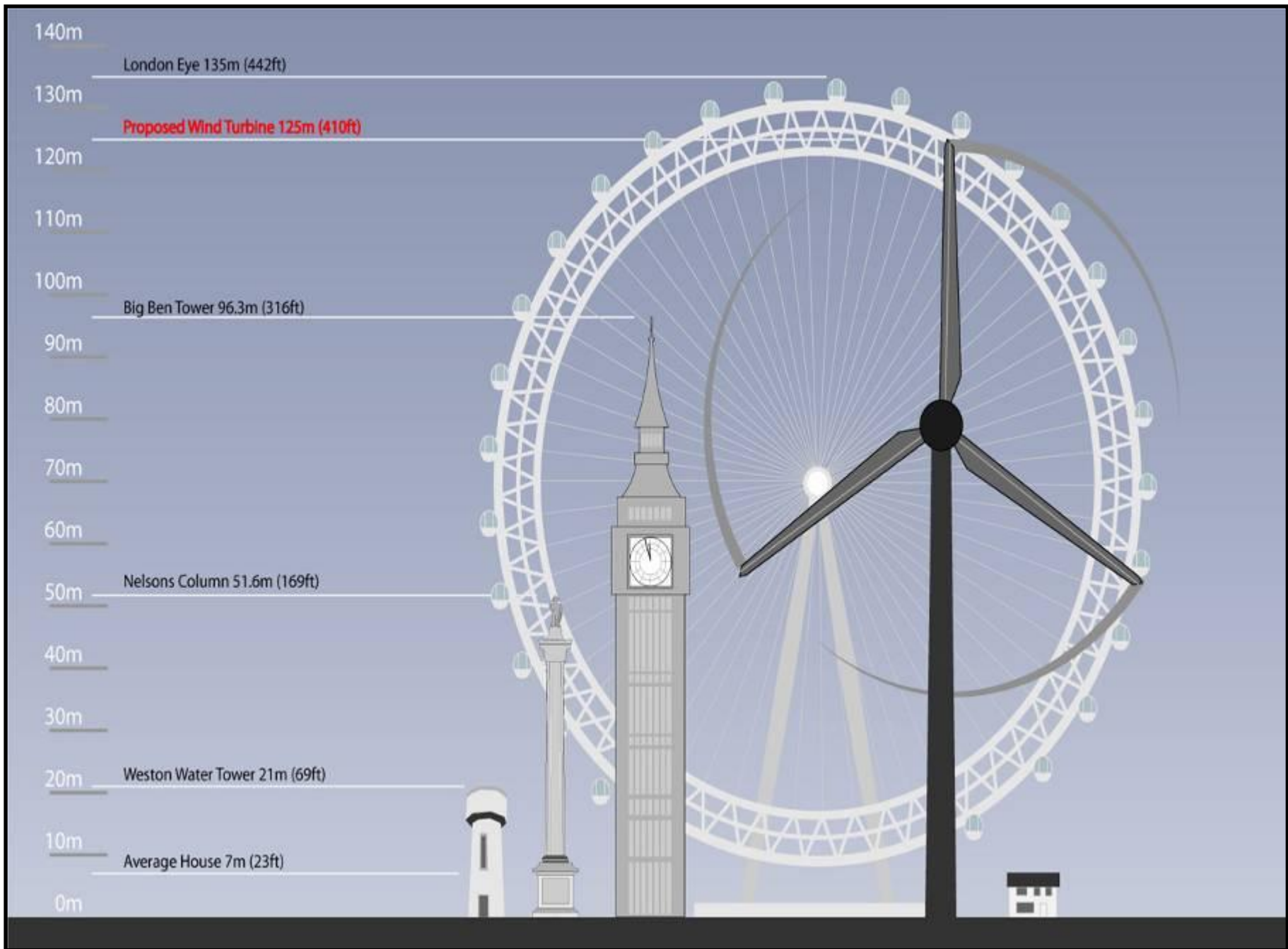
Click Red Inset to Zoom in



Altahullion Wind Farm



Simulated image of
Altahullion Wind Farm and Altahullion Extension



Planning Applications for Single Wind Turbines

April 2000 - February 2013

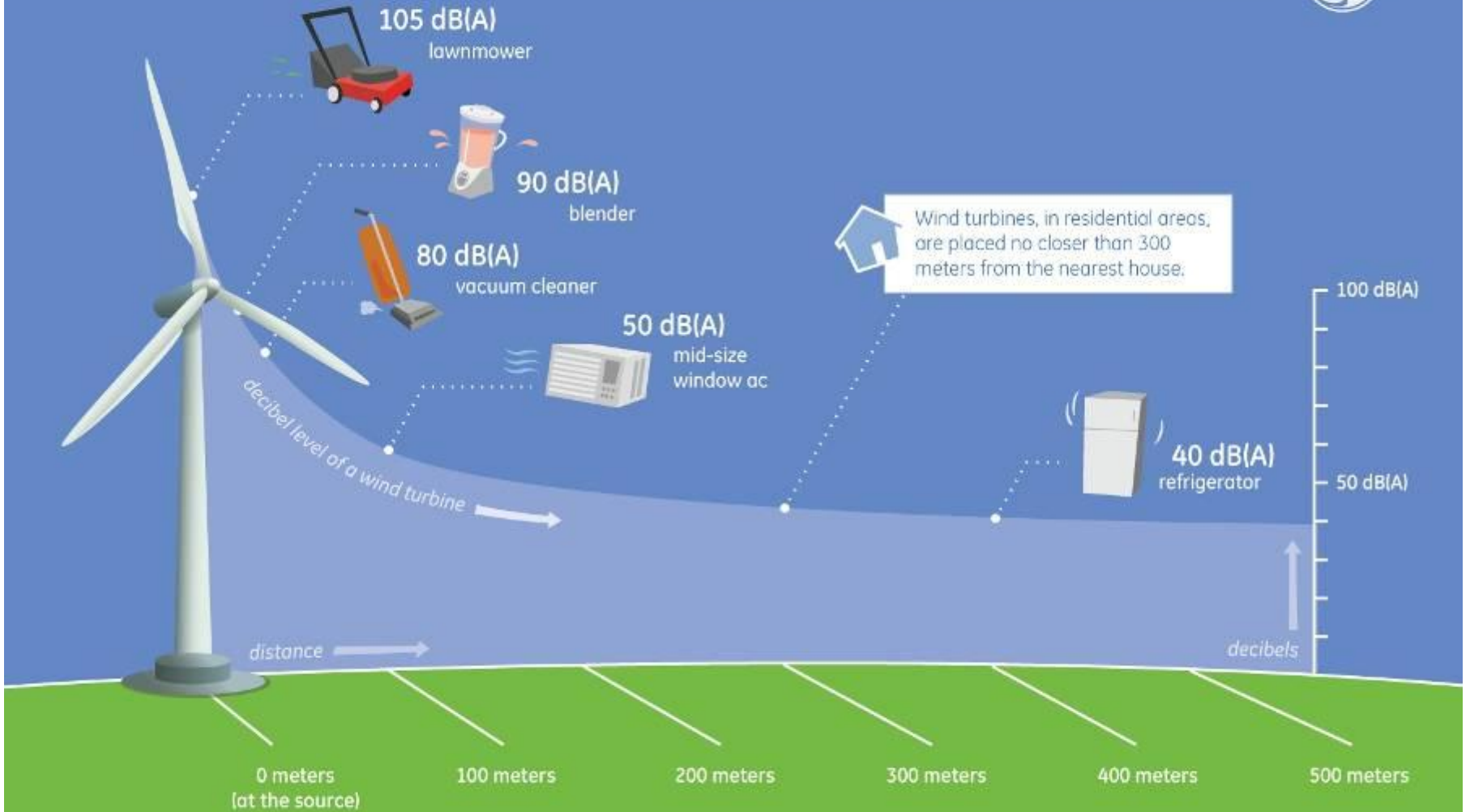
**Single Wind Turbines
Planning Decision**

- Permission Granted
- Decision Pending
- Application Withdrawn
- Approved on Appeal
- Permission Refused



0 4.25 8.5 17 25.5 34
Kilometers

How Loud Is A Wind Turbine?



SOURCE: GE Global Research; National Institute of Deafness and Other Communication Disorders (NIDCD part of NIH)



aberdeenshire.mp4

Factors affecting received noise level

- **Sound power level of turbine(s)**
- **Separation distance**
- **Atmospheric absorption**
- **Ground absorption**



Northern Ireland Planning Policy

Planning Policy Statement 18 Renewable Energy

“Development that generates energy from renewable resources will be permitted provided the proposal, and any associated buildings and infrastructure, will not result in an unacceptable adverse impact on:

a) public safety, human health, or **residential amenity**

Wind Energy Development

- must demonstrate that the development will not cause significant harm to the safety or amenity of any sensitive receptors (including future occupants of committed developments) arising from **noise**, shadow flicker, ice throw, and reflected light.



Best Practice Guidance to Planning Policy Statement 18 “Renewable Energy”

This methodology (The Assessment and Rating of Noise from Wind Farms (ETSU-R-97)) should be used in the assessment and rating of noise from wind energy developments.”



GB Planning Policy

- **England - Planning practice guidance for renewable and low carbon energy, July 2013**
- **ETSU-R-97 should be used by local planning authorities when assessing and rating noise from wind energy developments”.**



GB Planning Policy

England – National Planning Policy Framework 2012

- **“Notwithstanding the date of this report (ETSU-R-97), the Government is satisfied on the balance of subsequent scientific research, that its key conclusions (and in particular the limits it recommends) remain a sound basis for planning decisions”**



HAYES MCKENZIE REPORT 2011

Analysis of How Noise Impacts are Considered in the Determination of Wind Farm Planning applications

Recommended that technical guidance was needed to ensure consistency in how noise impact assessments are undertaken

HAYES MCKENZIE
PARTNERSHIP LTD



Prepared for:

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Area 4B, 3 Whitehall Place,
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Research Contract 01.08.09.01/492A (Analysis)

Analysis of How Noise Impacts are Considered
in the Determination of Wind Farm Planning Applications

HM: 2293/R1

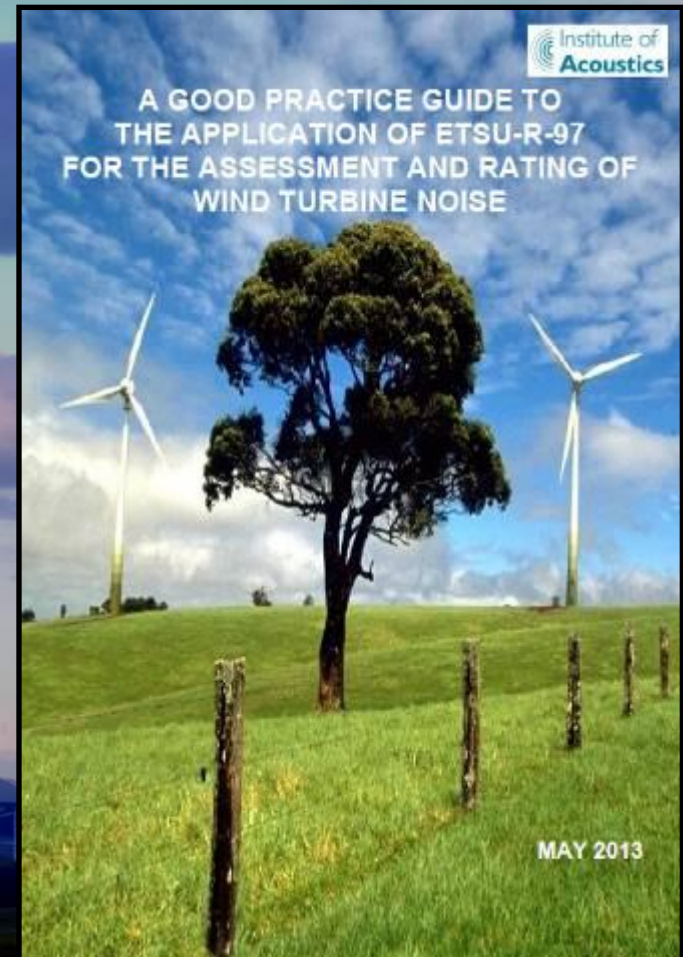
6th April 2011

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IOA GOOD PRACTICE GUIDE

MAY 2013

Department of Energy and Climate Change funded the IOA to develop a good practice guide on the application of ETSU-R-97, in line with the recommendations of the 2011 Hayes McKenzie report. However, terms of reference did not permit a review of the noise limits.



ETSU-R-97 noise limits

- **Day-time – 5dB (A) above background noise levels across wind speeds up to 12m/s subject to a minimum level within the range 35 – 40dB(A).**
- **Night-time – 5dB(A) above background noise level across wind speeds up to 12m/s, subject to a minimum level of 43dB(A).**
- **Financially involved noise limit – lower fixed limit can be increased to 45dB(A) for both day and night-time.**



ETSU Assessment Procedure

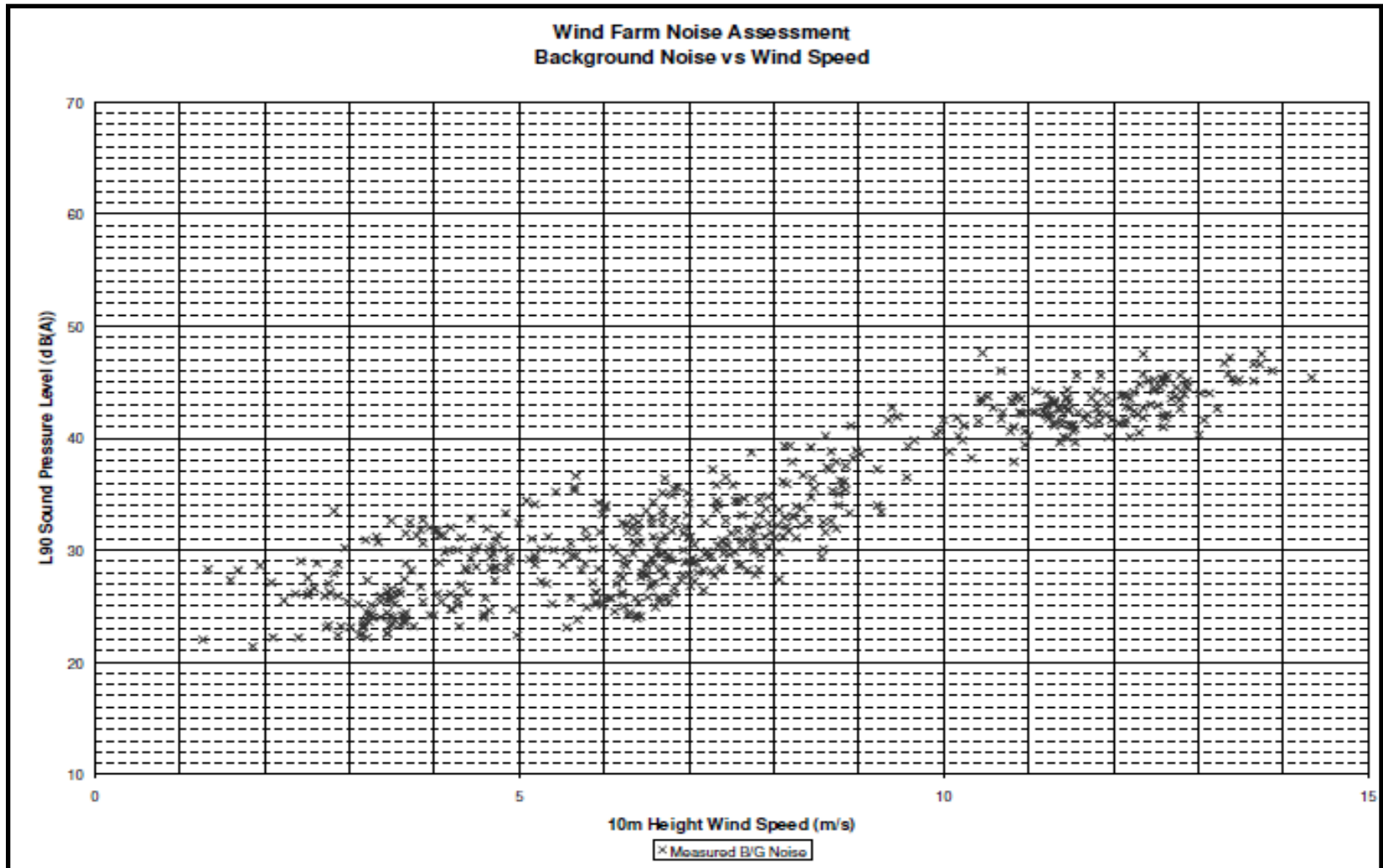
- **A background noise level survey at potentially affected properties.**
- **Noise limits derived from background noise levels.**
- **Wind farm noise predicted across wind speed range and compliance assessed.**



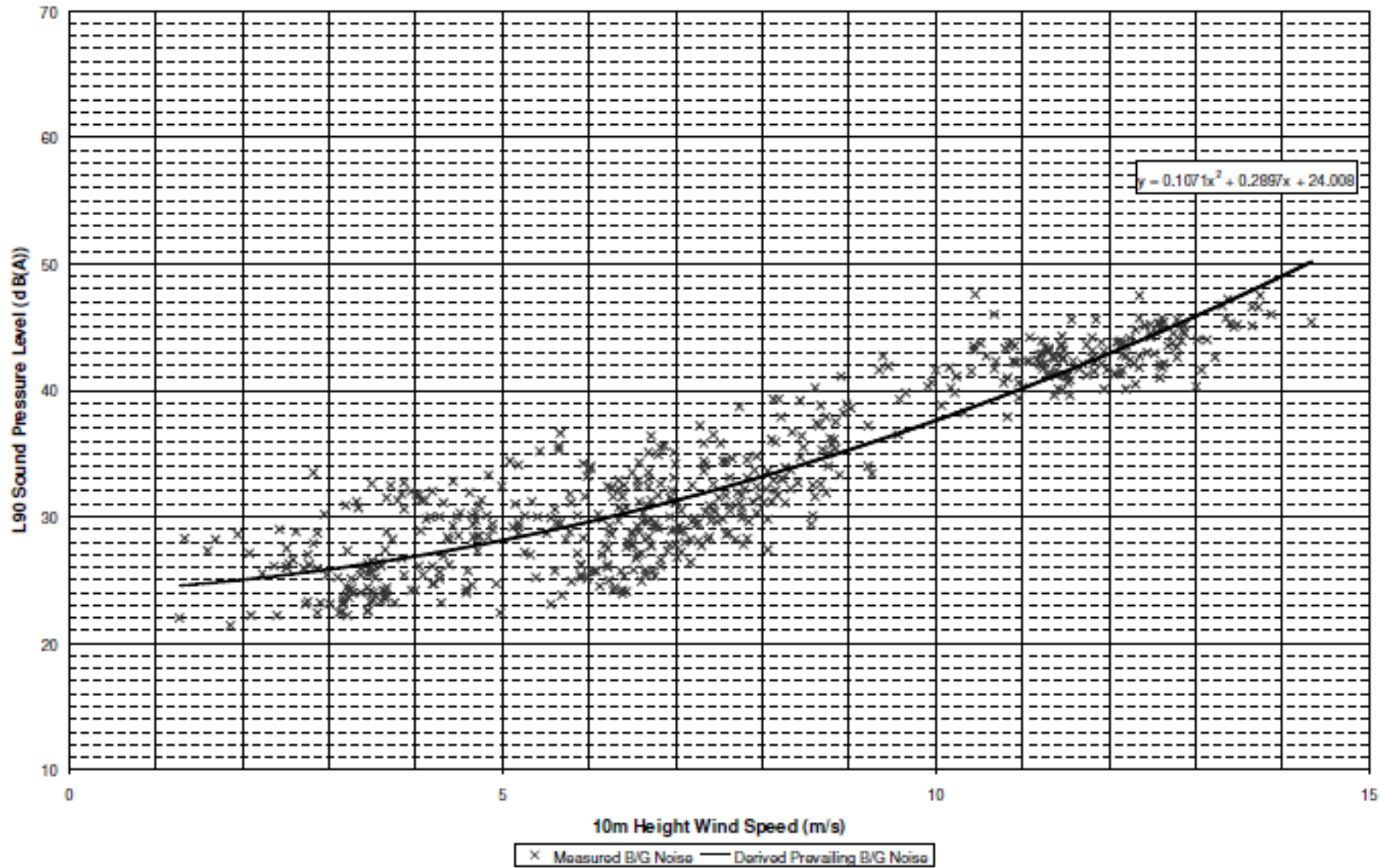
Measurement of Background Noise Levels



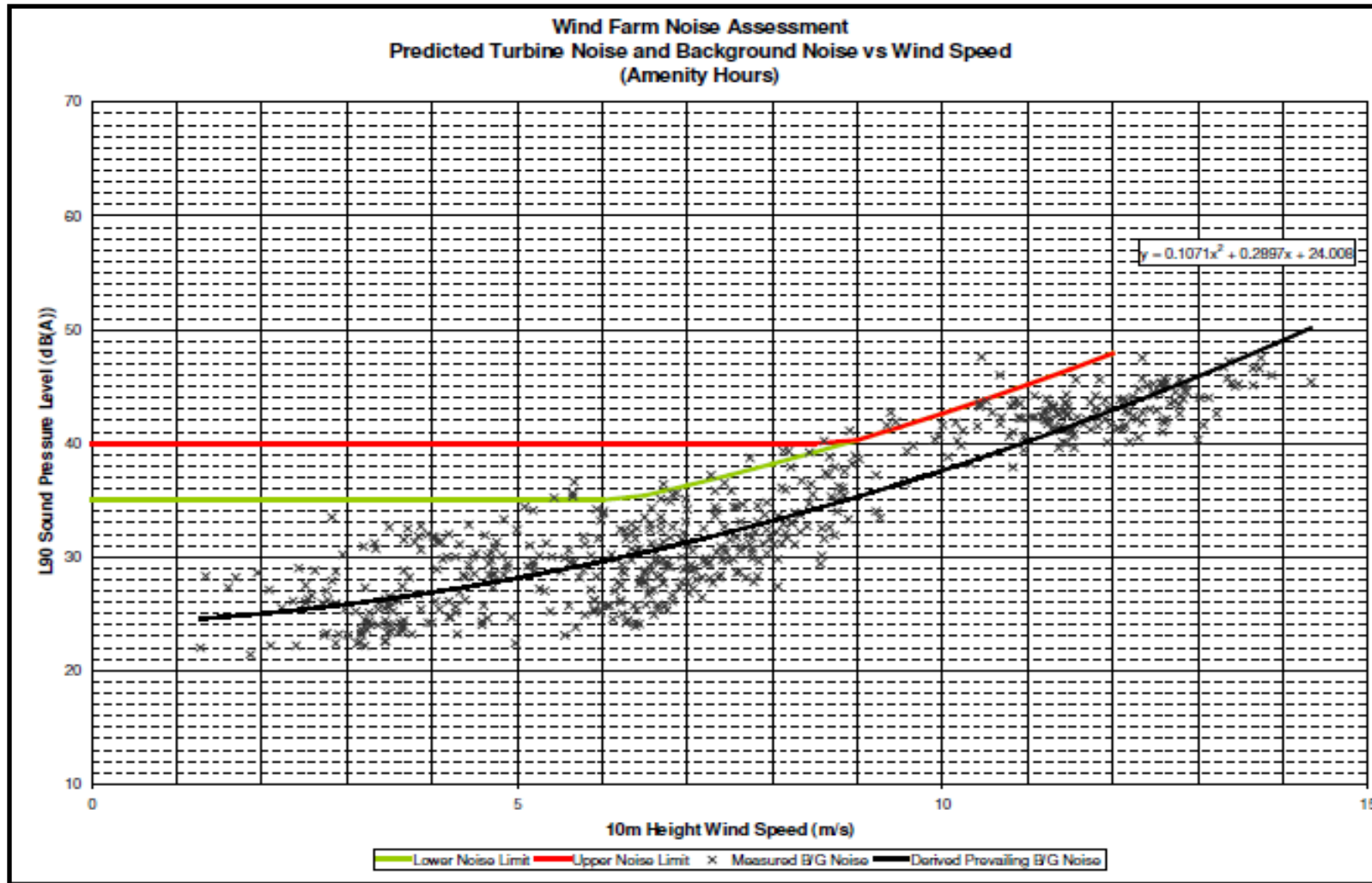
Background noise levels plotted against wind speed



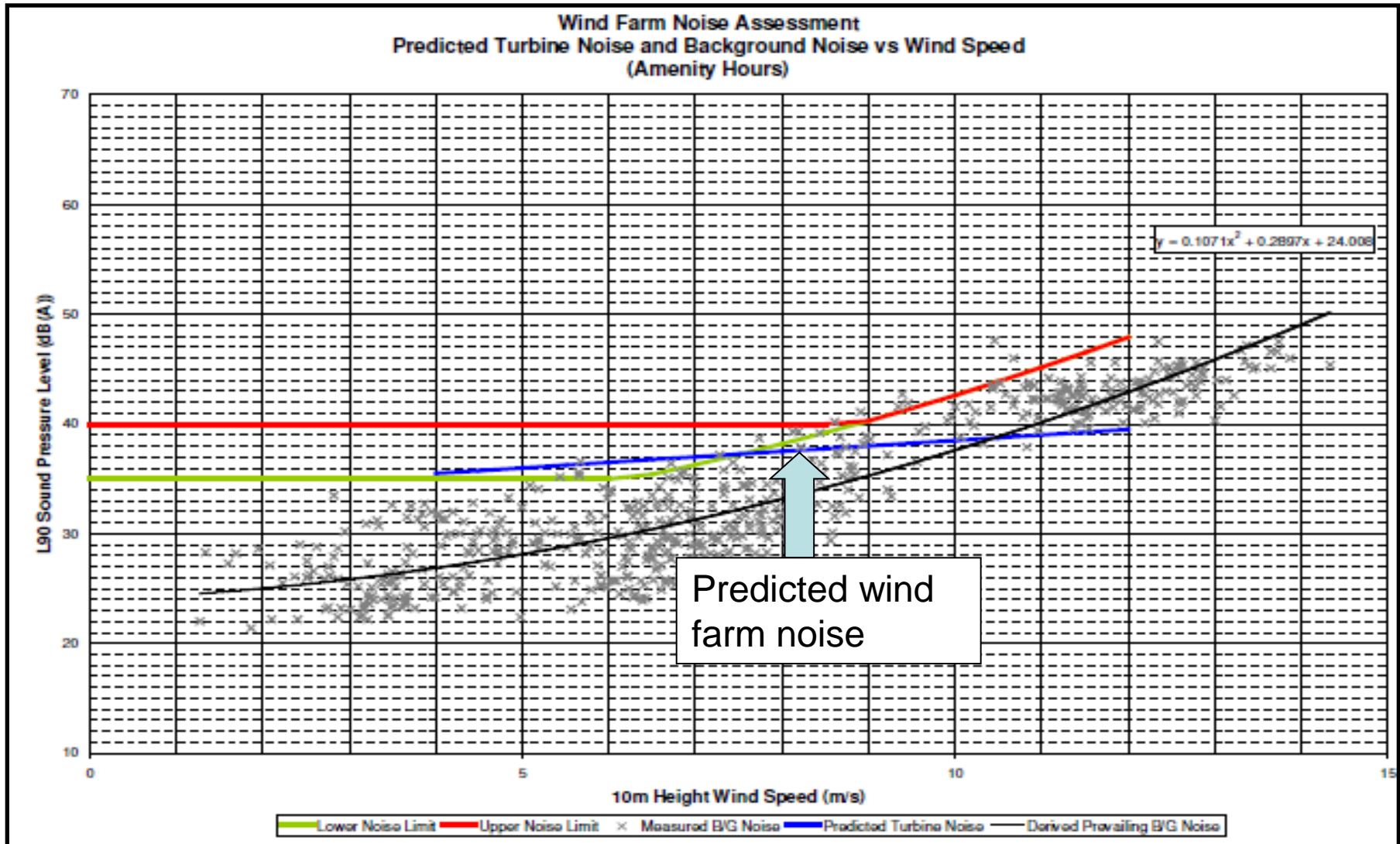
Wind Farm Noise Assessment Background Noise vs Wind Speed (Amenity Hours)



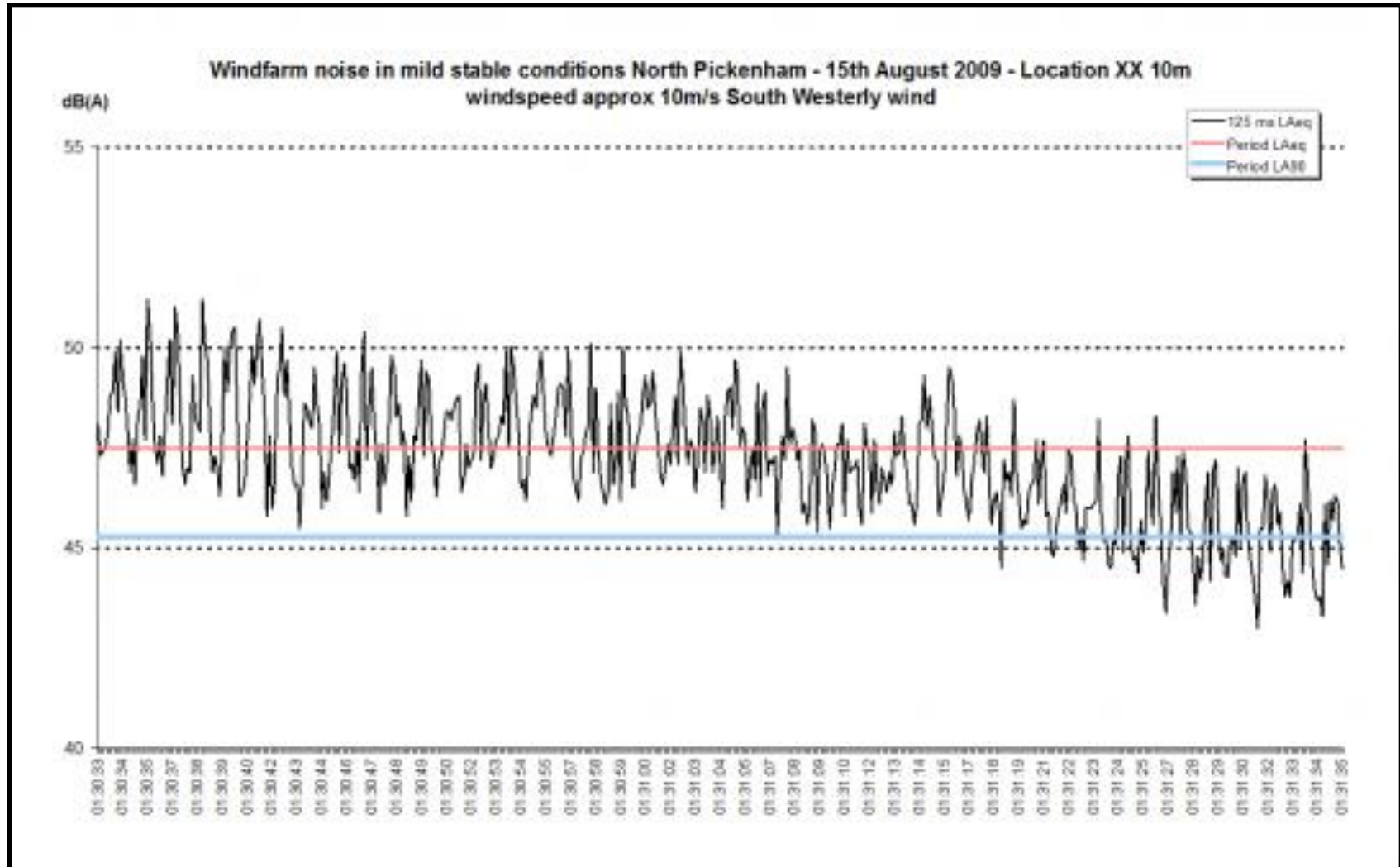
ETSU derived limits (day-time)



Assessing compliance



Amplitude Modulation



Planning conditions

- **Noise limits**
- **Post-commissioning verification monitoring exercise**
- **Complaint investigation by operator**
- **Report of noise monitoring in connection with post-commissioning exercise or complaint investigation**
- **Construction noise condition**

