

IoA Scottish Branch

The Acoustics of Unconventional
Oil & Gas

The Lancashire Appeals 2016

Lancashire County Council's Position

Andy McKenzie

Hayes McKenzie Partnership Ltd
Salisbury & Machynlleth

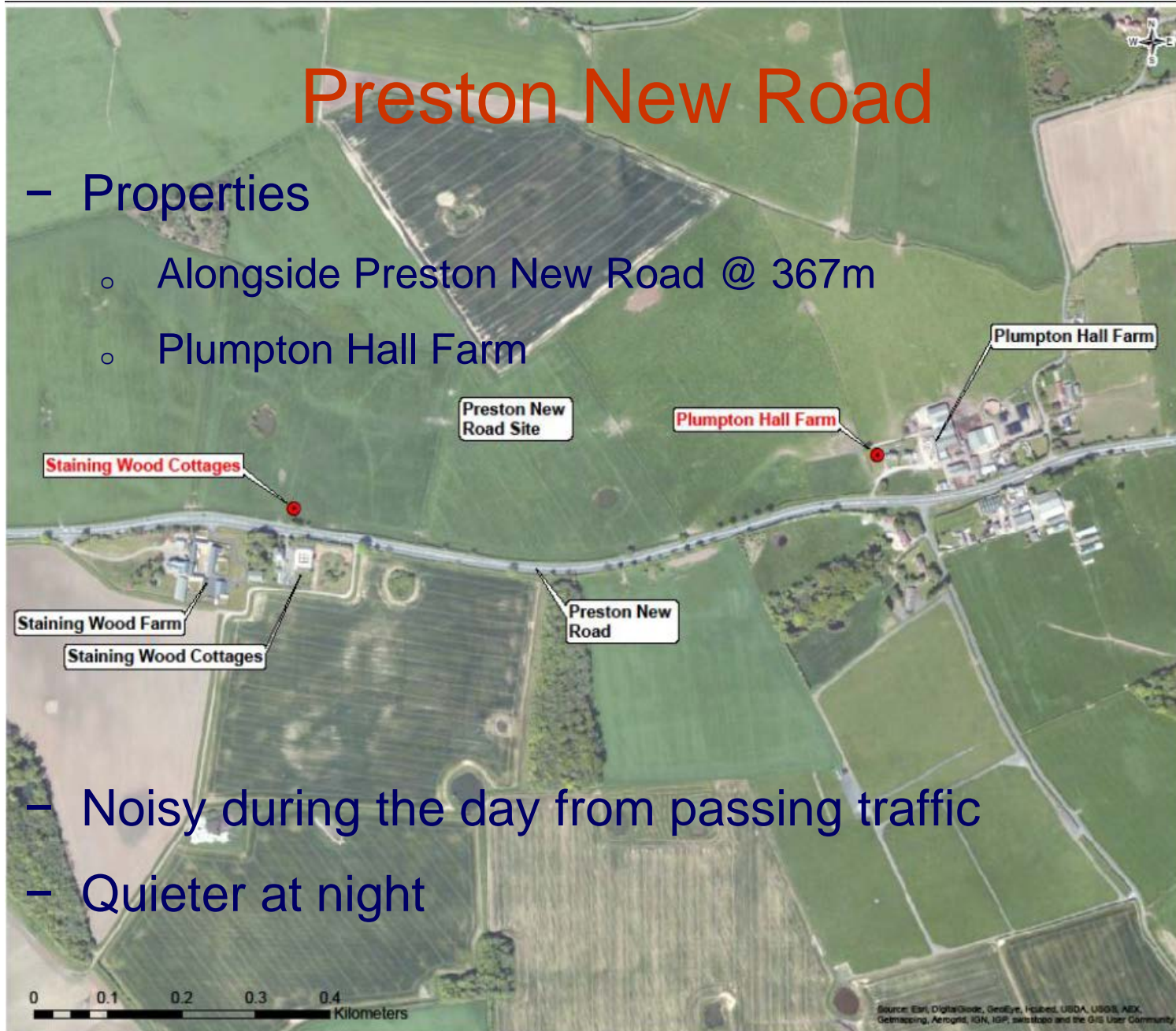
Planning Situation

- LCC received applications in 2014 for:
 - 2 Shale Gas Exploration Sites
 - 2 Corresponding Monitoring Arrays
(LCC had previously determined 5 shale gas applications in 2010)
- Exploration work* comprises:
 - Construction
 - Drilling
 - Hydraulic Fracturing
 - Initial Flow Testing
 - Extended Flow Testing
 - Decommissioning & Restoration

Preston New Road

– Properties

- Alongside Preston New Road @ 367m
- Plumpton Hall Farm



- Noisy during the day from passing traffic
- Quieter at night

Roseacre Wood



- Properties:

- o Old Orchard Farm @ 404 m
- o Roseacre Farm
- o Stanley Farm

- Nearer to M55 to the north but no passing traffic

Main Concerns (Both Sites)

- Drilling*
 - Continuous operation for 5+3=8 + 3 + 3 months
 - 24/7 operation (noise at night)
 - Predicted level around 42 and 40 dB L_{Aeq}
- Hydraulic Fracturing*
 - 3 hours per day for 4 x 2 month periods
 - Weekdays day-time only
 - Predicted level around 55 dB L_{Aeq}

Roseacre Wood Site

- Mitigation* reduced predicted noise at night to 37 dB L_{Aeq}
- Following this, LCC officers had no objection on noise
- Reason for refusal at planning committee did not include noise
- Refusal on other grounds led to Planning Appeal process and Public Inquiry

Preston New Road Site

- Mitigation* reduced predicted noise at night to 39 dB L_{Aeq}
- Following this, LCC officers had no objection on noise
- Refusal by planning committee included that:
“The development would cause unacceptable noise impact resulting in a detrimental impact on the amenity of local residents which could not be adequately controlled by condition contrary to Policy DM2 of the Lancashire Minerals and Waste Local Plan and Policy EP27 of the Fylde Local Plan”
- Refusal on noise and other grounds led to Planning Appeal process and Public Inquiry

Policy DM2 - Development Management

Development for minerals or waste management operations will be supported where it can be demonstrated to the satisfaction of the mineral and waste planning authority, by the provision of appropriate information, that all material, social, economic or environmental impacts that would cause demonstrable harm can be eliminated or reduced to acceptable levels. In assessing proposals account will be taken of the proposal's setting, baseline environmental conditions and neighbouring land uses, together with the extent to which its impacts can be controlled in accordance with current best practice and recognised standards.

In accordance with Policy CS5 and CS9 of the Core Strategy developments will be supported for minerals or waste developments where it can be demonstrated to the satisfaction of the mineral and waste planning authority, by the provision of appropriate information, that the proposals will, where appropriate, make a positive contribution to the:

- Local and wider economy
- Historic environment
- Biodiversity, geodiversity and landscape character
- Residential amenity of those living nearby
- Reduction of carbon emissions
- Reduction in the length and number of journeys made

This will be achieved through for example:

- The quality of design, layout, form, scale and appearance of buildings
- The control of emissions from the proposal including dust, noise, light and water.
- Restoration within agreed time limits, to a beneficial afteruse and the management of landscaping and tree planting.
- The control of the numbers, frequency, timing and routing of transport related to the development

Fylde Local Plan Policy EP27

DEVELOPMENT WHICH WOULD UNNECESSARILY AND UNACCEPTABLY RESULT IN HARM BY WAY OF NOISE POLLUTION WILL NOT BE PERMITTED. WHERE APPROPRIATE, PLANNING PERMISSION WILL BE GRANTED SUBJECT TO CONDITIONS TO MINIMISE OR PREVENT NOISE POLLUTION.

Public Inquiry at Blackpool FC

- Main Issues

- Planning
- Landscape and Visual
- Traffic
- Noise

- Parties

- Cuadrilla (The Appellant)
- LCC
- PNRAG (Preston New Road Action Group)
- RAG (Roseacre Wood Action Group) + Associated Parish Council
- Friends of the Earth
- North-West Chamber of Commerce

Public Inquiry (cont.)

- **Issues Considered Specifically Excluded:**
 - Anything under the ground
 - Regulated by DECC and the Environment Agency
 - Not 'planning issues'
- **Outcome**
 - Inspector makes recommendation by July 4th 2016
 - Secretary of State makes final decision
- **Security!**
 - Well managed – no 'incidents'

Relevant Noise Guidance

- **Over-Reaching**

- National Planning Policy Framework
- Noise Policy Statement for England

- **More Specific**

- Planning Practice Guidance on Noise
- Planning Practice Guidance on Minerals

- **'Other' Guidance**

- BS5228 - Code of Practice for Noise and Vibration Control on Construction and Open Sites
- BS4142 -Methods for Rating and Assessing Industrial and Commercial Sound
- WHO Guidelines for Community Noise and Night Noise Guidelines for Europe

National Planning Policy Framework

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity.

Noise Policy Statement for England

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life
- Also introduces:
 - No Observed Effect Level (NOEL)
 - Lowest Observed Adverse Effect Level (LOAEL)
 - Significant Observed Adverse Effect Level (SOAEL)

Planning Practice Guidance on Noise (1)

- Below the NOEL
 - noise is not noticeable and there is no effect
 - no specific measures are required.
- Between NOEL and LOAEL
 - noise can be heard but does not cause any change in behaviour or attitude although it can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life
 - no specific measures are required.
- Between LOAEL and SOAEL
 - noise can be heard and causes small changes in behaviour with potential for some reported sleep disturbance
 - noise should be mitigated and reduced to a minimum.

Planning Practice Guidance on Noise (2)

- Above SOAEL
 - noise causes a significant change in behaviour with potential for sleep disturbance resulting in difficulty getting to sleep, premature awakening and difficulty in getting back to sleep
 - such circumstances should be avoided.
- New Concept of 'Unacceptable Adverse Effect Level'
 - includes regular sleep deprivation/awakening
 - such circumstances should be prevented.

Planning Practice Guidance on Minerals

- Day-Time (0700-1900)
 - 10 dB above background L_{A90} or, where this will be difficult without imposing unreasonable burdens on the mineral operator, as near to that level as practicable and not exceeding 55dB L_{Aeq}
- Evening (1900-2200)
 - 10 dB above background L_{A90} and not exceeding 55dB L_{Aeq}
- Night (2200-0700)
 - Noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator, subject to a maximum of 42dB L_{Aeq}

n.b. All noise levels are free-field

BS5228

3.11 open site

site where there is significant outdoor excavation, levelling or deposition of material

NOTE 1 Examples include quarries, mineral extraction sites, an opencast coal site or other site where an operator is involved in the outdoor winning or working of minerals.

NOTE 2 Waste disposal sites and long term construction projects can, in most cases, be treated as open sites.

Table E.1 Example threshold of significant effect at dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23.00–07.00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3 Applied to residential receptors only.

^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

^{D)} 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

BS4142

The standard is not intended to be applied to the rating and assessment of sound from:

- a) recreational activities, including all forms of motorsport;
- b) music and other entertainment;
- c) shooting grounds;
- d) construction and demolition;
- e) domestic animals;
- f) people;
- g) public address systems for speech; and
- h) other sources falling within the scopes of other standards or guidance.

The standard is not intended to be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels.

WHO Guidelines for Community Noise

Table 4.1: Guideline values for community noise in specific environments.

Specific environment	Critical health effect(s)	LAeq [dB]	Time base [hours]	LAmx, fast [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms and pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school Bedrooms, indoors	Sleep disturbance	30	sleeping -time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time	30	8	40
	Sleep disturbance, daytime and evenings	30	16	-
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial, shopping and traffic areas, indoors and Outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music through headphones/ Earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults)	-	-	140 #2
	Hearing impairment (children)	-	-	120 #2
Outdoors in parkland and conservation areas	Disruption of tranquillity	#3		

WHO Night Noise Guidelines for Europe

Therefore, 40 dB $L_{\text{night, outside}}$ is equivalent to the lowest observed adverse effect level (LOAEL) for night noise. Above 55 dB the cardiovascular effects become the major public health concern, which are likely to be less dependent on the nature of the noise. Closer examination of the precise impact will be necessary in the range between 30 dB and 55 dB as much will depend on the detailed circumstances of each case.

For the primary prevention of subclinical adverse health effects related to night noise in the population, it is recommended that the population should not be exposed to night noise levels greater than 40 dB of $L_{\text{night, outside}}$ during the part of the night when most people are in bed. The LOAEL of night noise, 40 dB $L_{\text{night, outside}}$, can be considered a health-based limit value of the night noise guidelines (NNG) necessary to protect the public, including most of the vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise.

Main Areas of Debate

- Interpretation of Assessment Guidance

- Is BS5228 relevant to shale gas drilling and fracturing ?
- In PPG-M, what constitutes an 'unreasonable burden'?
- Also in PPG-M, what is 'background noise L_{A90} ' given variability?
- What are values for NOEL, LOAEL, SOAEL, UAEL in this case?
- Are these consistent with other guidance?
- How relevant are sleep disturbance criteria based on transport sources in this case and what is nature of disturbance?
- Are particular sensitivities of nearby residents relevant?
- Relevance of limits set for other shale gas sites in Lancashire?
- Relevance of limits and LOAEL SOAEL values set for nationally important construction projects (HS2, A14(T))?

Other Areas of Debate (1)

- Predicted Noise Levels
 - Establishment of source noise levels
 - Effect of different equipment to that modelled for ES and subsequently
 - Propagation effects
 - Overall uncertainty in predicted noise levels
- Noise Character
 - Tonal Content
 - Impulsive Content
 - Low Frequency Content
 - Instantaneous Max Levels

Other Areas of Debate (2)

- Planning Conditions

- Actual day-time and night-time limits to be applied to each site
- Need for a separate 'evening' and 'weekend' limits?
- Location and spec. of permanent monitoring location
- Need for constant audio recording
- Elimination of tonal and impulsive content without making requirements 'unreasonable'
- How to eliminate 'other' sources from monitoring process

Final LCC Position

- Relevant guidance is PPG-M
- Day-time limit of 55 dB L_{Aeq} is acceptable in the absence of comprehensive baseline data
- Night-time limit of 42 dB L_{Aeq} is not appropriate. Meeting a limit lower than this should not constitute an unreasonable burden given ability to meet a lower limit with mitigation.
- 42 dB L_{Aeq} is night-time SOAEL for minerals due to provisions of PPG-M. LOAEL not known but suggested to be around 35 dB L_{Aeq}
- Cuadrilla should revisit site design / equipment specification to comply with a lower limit
- This will also need to take account of uncertainty in predicted noise levels to ensure limits can be met in practice
- Agreed that tonal and impulsive content can be 'controlled'
- No need for specific 'low frequency' consideration

Planning Conditions

- Day-time limit of 55 dB L_{Aeq} agreed for both sites in the absence of comprehensive baseline data
- Night-time limit of 37 dB L_{Aeq} proposed by LCC for both sites for consistency with committee decisions on PRN and RW sites and PPG-M
- No separate evening limit but night-time limit agreed to apply from 2100
- LCC supports proposal by PNRAG for separate weekend day-time limit of 45 dB L_{Aeq}
- Permanent monitoring to be carried out at agreed location with on-line access to data
- Audio recording to be triggered at a value to be agreed with LCC
- Tonal and impulsive content only restricted for 'steady-state' noise above 30 dBA
- Elimination of 'other' sources left to methodology to be agreed

THANK YOU!

- Inspectors report and SoS Decision keenly awaited!
- Enjoy David Hillers Presentation

Andy McKenzie

Hayes McKenzie

andy@hayesmckenzie.co.uk

www.hayesmckenzie.co.uk