Cotton Farm Wind Farm Assessment Update. December 2019

Why is there a sudden spate of emails from SCDC advising on their restart of noise assessment?

Several villagers have asked for an explanation, in layman's terms, why SCDC have suddenly restarted noise assessment by unannounced personal visits to locations in the village.

The officers, it seems, have restarted visits using Statutory Nuisance (SN) procedures. They are, apparently, ignoring the procedures advised in the planning document ETSU-R-97 or the complaints procedures as advised in the planning approval document for Cotton Farm Wind Farm (CFWF)[1]

As to why they are doing this is puzzling, especially as they are on record of stating there is, in their collective opinions, no evidence of SN from CFWF. It is possible they may have been galvanised into action by the involvement of the Ombudsman and restarting actions in response to noise complaints from the community. I will try and explain, as simply as possible, why the actions by SCDC/HDC and their assessment processes in the past, and currently restarted, are not what they should be doing. For more detailed explanations of specific points I will use appendixes attached to this document.

> *Personal Statement*
> *I must emphasise at all stages of the CFWF story I, and many others, have learned a lot about the wind industry locally and on a national basis, I have researched a large number of publications, attended wind farm noise seminars and wind farm appeals. (Including as a witness) I and others have consulted a large number of experts who have provided professional information and explanation. This has allowed questions, with supporting evidence, to be asked which often proved to be very awkward with the local council officials. I am well aware many officers do not want to have meetings with me because of my previous and continuing pressure. This is a great pity because I fully appreciate they have many other problems to contend with, but working with the community instead of ignoring it, would have resolved many issues and very likely to have resolved the impasse we currently have.*
>
> **This document is E&OE.**

Wind Farm Planning Legislation.

The planning legislation for wind turbines and windfarms is known as ETSU-R-97. This is a planning document designed to both provide the rules of building and the continuing operation of a wind farm with respect to noise issues. It also provides the noise limits (dB) of noise emissions to protect the public and records a noise complaint procedure. The document was, however, hastily assembled by people with involvement with the early development of the wind industry in the mid 1990's and the final documents effectiveness and reliability was then, and still is, severely criticised. It contains many flaws. Some will be highlighted in this document. It was rushed into being to fulfil a former Governments energy policy without it being properly tested. It is, however, a legal document. See appendix 1.

ETSU is the controlling document for the planning approval at CFWF. Very quickly major problems over noise were identified in the EIS[2] at the pre-determination stage by CFAG. These are documented elsewhere[3]. It is important to note during the appeal the issues on noise were not attended by council officers or their legal team.

> *The HDC EH department did not get a copy of EIS, as provided by the developer. It was not forwarded on from the planning department in HDC. This was admitted to CFAG, after the appeal by the then planning officer responsible. The EH department must have signed off the noise section without, apparently, even seeing it let alone assessing it.*

There is a very important section in ETSU which has not been recognised by either council, and that is the complaints procedure. (ETSU Page 87). This section is amplified (in very convoluted way) to become the individual wind farm

[1] Appeal Ref: APP/H0520/A/09/2119385
[2] Environmental Impact Assessment. A huge document supplied as part of the CFWF planning application in 2007.
[3] www.heatonharris.com/sites/www.heatonharris.com/files/2019-01/inwg_wp9_aug_2015.pdf History of Cotton Farm

sites noise complaint procedure. In our case at CFWF, this is Noise Condition 24. (C24) It is in C24 the tables of the maximum noise limits, in dB at specific wind speeds for a number of sample sites are recorded.

> *The basic noise condition template was, I suspect, initially developed by wind industry acousticians for an early wind farm approval document. It has been, apparently, copied and used for most wind farms approval noise conditions ever since and modified to cover local inputs and conditions. (i.e. Maximum noise limits in dB tables at various local sites)*

This leads us to a further confusion in the councils' Joint Statement comment where the opening paragraph comment is repeated in page 2, first para where the final sentence states-:

> *The report finally concludes the windfarm is compliant with Condition 24 at all five residential locations around the site.*

It looks good until one realises HDC only wanted, as is stated in the opening paragraph, to prove compliance under Noise Condition 24 after turbine modifications. It is not possible to be compliant to C24 because C24 is a complaint procedure. The joint statement should have read-:

> *The report finally concludes the windfarm is compliant with **the noise limit charts contained in** Condition 24 at all five residential locations around the site.*

The second modified statement is factually correct and, very importantly, correctly isolates or ring fences, the compliance exercise after the blade modification. This compliance exercise, however, has nothing to do with complaints from residents and the compliance reported in it should not be used as 'evidence' to complaints as implied in the joint statement. CFWF has not been tested for compliance using complaint procedures.

Wind speed and noise levels (dB) at specific locations recorded in C24 are, however, common to both compliance and complaint. Further explanation are contained in Appendix 2

Statutory Nuisance.

In the joint statement each council concentrated on AM and Statutory Nuisance in isolation. The joint statement quoting the appeal inspector comments was used, I suggest, to try and legitimise statutory nuisance as to being the only means of dealing with noise complaints. This is incorrect. The complaints with respect to noise is contained in C24 which, in turn, is based on the ETSU complaints procedure. This includes all noise complaints **including complaints with AM content**. It is this procedure which the councils should have pursued and not exclusively pursuing AM through statutory nuisance which they have already and repeatedly, rejected. This is expanded in appendix 3 as is the explanation of the Inspectors comments quoted in the joint statement.

Appendix 1 ETSU

Appendix 2 Understanding wind speed and noise emissions in dB.

Appendix 3 Statutory Nuisance and Noise complaint procedures

Appendix 1

ETSU-R-87

When wind turbines were first considered back in the early 1990's consideration had to be given to the impact of turbine noise to nearby communities. The British Standard covering man made noise was, and still is, BS4142. This standard covers all noise emissions from abattoirs and airfields to zoological parks with clay pigeon shooting ranges, motorway construction and quarrying, et al in the middle. (The updated version [BS4142:2014] also covers wind turbine emissions.) The earlier standard, when applied to the early wind turbine designs, basically indicated there was only about 5% of the land mass in the UK suitable and safe for installing turbines. A committee of acousticians, based on Salford University, was set up to find a way around BS4142 and ETSU was developed.

For any legislation to get Government approval it usual for it to be tested. ETSU, however, was NOT tested and has, technically, not been approved or officially updated. Its use was initially accepted, and accepted ever since, because of common practice as it allowed the then Government energy policy to have immediate access to over 90% of the UK land mass as potential sites for wind farms.

Significantly the problems of Blade swish and thumping, now known as AM, was not mentioned or considered, in the formation of the ETSU document. The acousticians involved stated then and many times later at planning appeals, it would be very unlikely to occur beyond the immediate turbine location (i.e. beyond 350m)

> *Research shows the ETSU committee missed a very important research paper by NASA predicting AM emissions from turbine rotating blades would be experienced by communities over long distances from wind turbines*.

This explanation of ignoring AM noise continued to as late as 2010 and was quoted during the CFWF appeal and recorded by the inspector in para 90. It is be noted the suggestion to use Statutory Nuisance was made by the developer to replace a request for an 'AM Condition'. (Details can be seen in appendix 3.)

> probability, in my view. Thus I find no compelling evidence that warrants an approach to AM in this case which differs from that taken in ETSU-R-97. In these circumstances I do not believe that the suggested condition satisfies the test of necessity, even on a precautionary basis.
>
> 90. In the unlikely event of a problem of excess AM arising, the appellant suggests that it could be addressed by the local authority using statutory nuisance powers. Whilst I have some misgivings about this procedure because of the much higher threshold of harm that would inevitably apply, I see little option but to conclude that this is the best means currently available of resolving this issue.

Paragraphs 89 and 90, I suspect, are the ones HDC and SCDC are using as their authority for assessment under statutory nuisance only. It is quoted in the joint statement. A close examination of the inspectors approval report, recorded in the noise section from paras 69 to 97, shows a catalogue of uncertainty within the inspectors mind. It is to be particularly noted no AM reference is made in the Noise condition 24. It simply referred to 'noise'.

In the light of actual incidences of recorded and experienced high levels of excessive AM, the inspector was right to be concerned. The problem of actual EAM was accepted and recorded by both the Graveley noise monitor and separate recordings collected by the SCDC EHO Greg Kearney in 2013/4. These were based on the complaint process described in ETSU and C24. It is a fact that EAM (i.e. AM exceeding 3dB) occurs in well over 50% of each 24 hour day the turbines are rotating. This is far, far higher than anyone expected.

The current council officers recording personal experience using SN laws shows a lack of understanding of the noise emissions from the turbines or of the procedures laid down in the CFWF Planning Approval and its controlling legislation, ETSU-R-97 and has been described elsewhere.

Appendix 2

Understanding wind speed and noise emissions in dB.

The dB maximum permitted noise levels relative to wind speed at 10m, are recorded in the Planning Condition 24 (C24). The tables from it are copied below. The day time level 35dB recorded here was reduced from 40dB quoted in the EIS by the Inspector. The developers were very agitated during the appeal and only succeeded in raising the level to 40dB again at Cotton Farm. In the light of the communities experience and by monitoring the noise emissions, the concerns by the developers are now fully understood. It is very likely the developers were aware they were very close to the absolute limit of noise emissions at 40dB.The wind farm was shown, very early on, it was not compliant and exceeded the noise limits dictated by these charts as early as 2013/4.

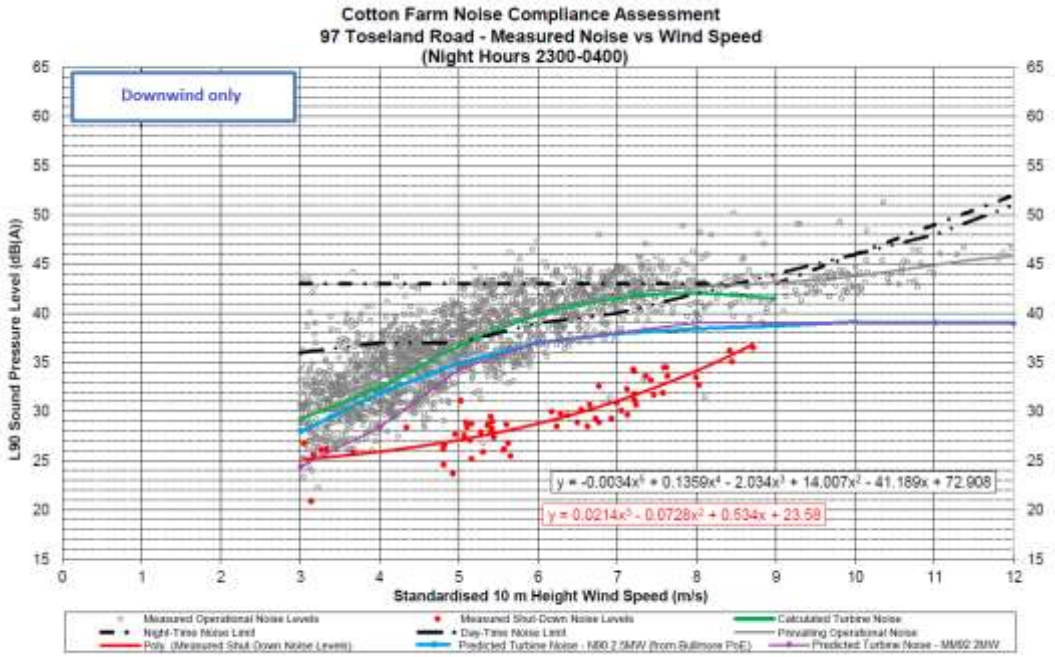
Table 1 - Between 07:00 and 23:00 - Noise level dB $L_{A90,\ 10\text{-minute}}$

Location	Standardised wind speed at 10 metre height (m/s) within the site averaged over 10-minute periods											
	1	2	3	4	5	6	7	8	9	10	11	12
Cotton Farm	40	40	40	40	40	40	40	42	45	47	50	52
Duck End Farm House	35	35	35	36	38	40	43	46	49	52	54	56
Green Acres	35	36	36	37	37	39	40	42	44	46	48	51
97 Toseland Road	35	36	36	37	37	39	40	42	44	46	48	51
College Farm	35	35	35	37	38	40	41	43	44	46	49	52
Bullens Farm	35	35	35	37	38	40	41	43	44	46	49	52
Hollow Farm	35	35	35	37	38	40	41	43	44	46	49	52
Green Farm	35	36	36	37	37	39	40	42	44	46	48	51
Great Parlow Close	35	35	35	35	35	37	40	42	45	47	50	52
Toseland Hall	35	36	36	37	37	39	40	42	44	46	48	51

Table 2 - Between 23:00 and 07:00 - Noise level dB $L_{A90,\ 10\text{-minute}}$

Location	Standardised wind speed at 10 metre height (m/s) within the site averaged over 10-minute periods											
	1	2	3	4	5	6	7	8	9	10	11	12
Cotton Farm	43	43	43	43	43	43	43	43	43	46	49	52
Duck End Farm House	43	43	43	43	43	43	43	46	49	53	55	57
Green Acres	43	43	43	43	43	43	43	43	43	46	49	52
97 Toseland Road	43	43	43	43	43	43	43	43	43	46	49	52
College Farm	43	43	43	43	43	43	43	43	43	44	47	51
Bullens Farm	43	43	43	43	43	43	43	43	43	44	47	51
Hollow Farm	43	43	43	43	43	43	43	43	43	44	47	51
Green Farm	43	43	43	43	43	43	43	43	43	46	49	52
Great Parlow Close	43	43	43	43	43	43	43	43	43	46	49	52
Toseland Hall	43	43	43	43	43	43	43	43	43	46	49	52

An X-Y chart initially produced by the acoustics company HMP[4] using their recorded data in 2013 produced the lines of noise limits based on these tables. This table is based on only 5 hours of night time recording only from the downwind from the turbines and averaged possibly on six months of data sets. Superimposed on the chart below are the polynomial produced from data sets recordings, collated by HDC, in green. Also superimposed are the projected maximum noise limit assessment calculated for the original planning document (Blue) and the readjustment applied for the appeal (purple)

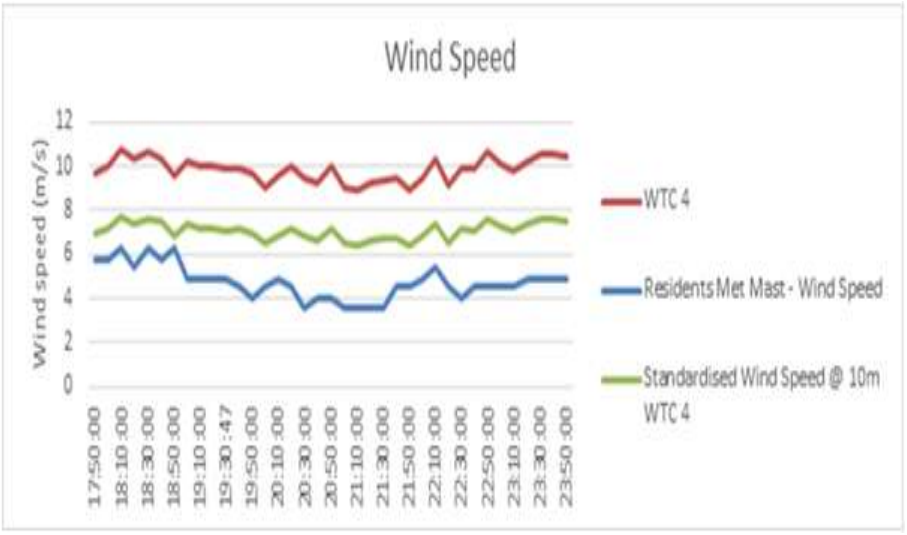


This 2013 chart, using many weeks of just 5 hours of night time data sets representing each 24 hours, clearly shows the wind farm is not compliant between wind speeds of 5 and 8 m/sec. The red polynomial shows the back ground noise with the turbines parked and not operating. This highlights the noise turbines contribute to the local noise levels.

[4] Hayes McKenzie Partnership.

The other concern is the use of 10m wind speeds. ETSU informs us of a method to calculate the wind speed at a receptor (someone's home) using the hub height wind. The calculation's need to consider wind shear. High up wind speeds (at 80m, the turbine hub height) are often much greater that at 10m. See the HDC chart below.

The calculation, contained in ETSU, is a constant, as HDC found out some time back. This chart, over a six hour period, also included actual 10m wind speed data (The Graveley monitor site has a 10m met mast) which demonstrates it is NOT a constant.



Also the calculation is always used in the wind industry calculations <u>even when, ETSU states, actual 10m wind speeds are, when available, can be used.</u> Using the actual 10m fulfils the requirement of the wind speed measurement to refer to the C24 dB charts recorded above.

Looking at the chart one can see the dB levels vary enormously. If one looks at the chart above, and take a sample at 20:50 the hub height wind speed(red is 10m/sec. The wind speed at the 10m met mast (blue) is actually 3.5m/sec. The ESTU calculated wind speed (green) is 7 m/sec.

Location	Standardised wind speed at 10 metre height (m/s) within the site averaged over 10-minute periods											
	1	2	3	4	5	6	7	8	9	10	11	12
97 Toseland Road	35	36	36	37	37	39	40	42	44	46	48	51

It is day time calculation. Looking at the dB chart for Toseland Road the calculated spot check at 7m/sec is 40dB max limit. However the actual at 3.5m/sec is 36dB. This 4dB difference is huge. It is a fact that if the dB max charts were readjusted to reflect actual 10m wind speed the likelihood of non-compliance would dramatically increase. <u>It is a fact the councils actually have the authority to adjust the dB levels if it is proven the charts are incorrect.</u> Wind shear is not a constant and the only actual 10m wind speed measurements should be used.

Appendix 3

Statutory Nuisance and Noise complaint procedures.

There are two important facts to be highlighted with respect to the actions carried out by the councils. The first is the Appeal Inspectors comments on AM and its importance in supporting actions carried out by the councils, especially SCDC.

1 On reading the inspectors report in the planning approval document in full one can see the inspector was NOT happy with the (developer's legal teams) suggestion of using statutory nuisance in the unlikely event of AM noise. His reluctance was specific to AM noise emissions only in the absence of specific legislation for AM emissions. CFAG had very specifically wanted an 'AM condition', as used in the Denbrook wind farm planning approval, to be also applied to CFWF noise conditions. The 'AM condition' would require the wind farm to be assessed for AM variation after building but before allowing licence to supply energy to the Grid. This means any excessive AM (over 3dB) would mean the wind farm is non-compliant. The developer made it very clear they did not want the 'AM condition' applied at CFWF and suggested the use of statutory nuisance in place of it. The inspector over-ruled the CFAG request for an 'AM condition' and went for statutory nuisance instead as shown in the final sentence in para 89

> probability, in my view. Thus I find no compelling evidence that warrants an approach to AM in this case which differs from that taken in ETSU-R-97. In these circumstances I do not believe that the suggested condition satisfies the test of necessity, even on a precautionary basis.
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> 90. In the unlikely event of a problem of excess AM arising, the appellant suggests that it could be addressed by the local authority using statutory nuisance powers. Whilst I have some misgivings about this procedure because of the much higher threshold of harm that would inevitably apply, I see little option but to conclude that this is the best means currently available of resolving this issue.

The reluctance of the acceptance of SN in place the Denbrook 'AM condition' did not over-rule or replace the complaints procedure in C24. It was a totally separate issue.

2 The second point is the council ignoring two government documents and their complaint procedures. The first, the planning document ETSU, is still the only (legal) document controlling noise issues with respect to both the design, construction and operation of a wind turbines. It is recognised by all authorities as a flawed document and its replacement is being considered, but it is still a legal document controlling the CFWF planning approval. This document contains a complaint section on page 87. This paragraph defines the parameters of collection of data and its assessment. Both HDC and SCDC have ignored this. The statements in the joint statement about consulting the community is, up to a point, true. It is to be noted the councils have not taken any notice of the requests from CFRA. CFRA, for example, repeatedly stated, in writing, they wanted assessment based on the use of 20 to 30 data sets as per ETSU page 87, to be applied to the 2018 monitored data. This was again and again totally ignored.

CFRA, has at its own expense, had random samples the 2018 data independently assessed using the ETSU page 87 complaints procedures shows periods when the CFWF is non-compliant to the dB maximum tables recorded in C24. This is exactly the same method used by CFAG on the 2013 data which confirmed the HDC non-compliance assessment. The councils still refuse to acknowledge the existence of the 2013 or the 2018 non-compliance evidence.

The other government document ignored by the councils is the planning approval report for CFWF.[5] This too is a legal document and contains procedures for noise complaints.(C24) These procedures were used by the SCDC EHO Greg Kearney in 2014 but his recording and assessment was not continued by his successors. HDC also used the (ETSU) process on monitored data collected in 2013 and identified non-compliance at several sites (Toseland Road in Graveley and College Farm in Gt. Paxton) This is also

[5] Appeal Ref: APP/H0520/A/09/2119385

confirmed in the submission supplied by Greg Kearney to the MP Chris Heaton Harris's questionnaire to all English councils in August 2014[6]. HDC did not respond to the MP's request despite further requests.

"Officers from HDC formally invoked planning condition 24 at Cotton Farm following the receipt of AM type noise complaints. Since identifying the noise limit breaches the operators have implemented a 'curtailed' operational mode as opposed to full operation. I can confirm that officers have heard occurrences of AM noise, however our investigation is on-going and we have yet to determine whether a statutory noise nuisance exists, or is likely to occur or recur."	Greg Kearney, Environmental Health Officer, South Cambridgeshire DC

It is to be emphasised the compliance tests carried out under the control of HDC based on the 2018 data did NOT follow the procedures outlined in C24 or page 87 of ETSU.

Comment.
It is to be noted nearly 80 noise complaints were lodged with the councils during the monitoring period. (Jan 2018 to July 2018) All these should have be processed using ETSU and C24 procedures. If the complaints were not justified under ETSU but the audio record shows unacceptable AM (i.e. over 3dB peak to trough) and this could be dealt with via other routes (BS4142:2014?) If this occurs this raises questions about the planning approval itself. That is another issue but the complaint process must be followed first.

[6] www.heatonharris.com/sites/www.heatonharris.com/files/2019-01/inwg_wp3.1_aug_2015.pdf