PROPOSED LIVESTOCK BUILDINGS

AT

LYME HOUSE FARM

NOISE IMPACT ASSESSMENT

14th June 2018

1.0 Introduction

This report has been requested by the Ribble Valley (RVBC) planning department following the consultation response received from the Environmental Health Department (EH) on 11th June 2018. The two current applications 3/2018/0374 and 3/2018/0376 are being considered separately by the planning officer. The request for this report also includes the requirement to refer to two previous applications which were approved with no objections.
This report considers all aspects.

It is understood that there is a requirement to consider the cumulative effect of noise. This will be assessed in relation to each of the two buildings and two extensions. In effect the two buildings have been approved for construction and the two extensions are pending a decision by the 22nd June.

For the purposes of this report the first two buildings already approved will be considered as additional new cattle housing and therefore a possible noise source. It is understood that the current two proposals will be mitigated by activating a planning consent which takes older buildings and an open feed yard out of use permanently. It would be reasonable to assume these will no longer be a possible future livestock noise source.

Information will be presented for the background noise from the road, other sources in the general locality and from the existing cattle buildings. Comment and diagrams will be provided showing the range of local meteorological conditions and possible effects on the subject sources and other local sources.

A breakdown of a noise data model for each of the two building approvals and two extensions to buildings will be provided. In addition a noise data model will be provided for the existing cattle buildings which form part of the background sources. Comment will be made on the likely model results in relation the levels at both sources and receptors. Also commented on are the likely levels as they reduce, including at identified local receptors some significant distance away.

To bring the assessment to a conclusion, comment will be made on the cumulative effect, losses over distance and the relation to benchmark levels by the time reduced noise levels reach the identified receptors.

2.0 Background details

Lyme House Farm is situated 3.5km north of the town of Longridge with access from Elm Brow also known as Chipping Road. The farm is situated in and at the south end of the Hodder Valley and has particular local meteorological conditions which differ from those at Longridge. The holding supports a dairy herd which has been established on the holding over three generations. The farm buildings are located 200m south east of the unclassified highway Elm Brow also known as Chipping Road.

Key to this report is the fact that the identified receptors are situated on or in very close proximity to local connector road Elm Brow. Elm Brow otherwise known as Chipping Road serves as a local service road from Longridge. Destinations include daily traffic flows to the villages of Chipping, Whitewell, Cowark, and Dunsop Bridge. This extensive rural catchment area known as the Hodder Valley also supports dozens of rural businesses and many farms. Although in a rural location the identified receptors are subject to relatively high levels of background noise from passing traffic.

On the subject holding there are three ages of farm building with the oldest being eighteenth century. These are to be taken out of production and hence the current proposals for building extensions. The new buildings will lie close to the north west side of the existing farm buildings and therefore any directional effects will be similar to the existing noise sources. The new buildings will have a diverse range of sound baffling, including timber space boarding, vented ridge and clad doors which can be adjusted from time to time. The range of baffle techniques aid the splitting of source noise to different directions and ensure there is no particular concentrated point source. Key observations include the doors being at north east/south east gables and the timber space boarding facing the receptors.

The subject buildings are at 96m above sea level with level grassland over the 200m distance to the nearest identified receptors. There are no commercial premises near to the farm other than a number of other livestock farms. Some of these local livestock farms lie in the main wind directions which are predominantly from the SW (south west), WSW and SSW. Therefore these will provide some minimal background effect of similar noise types at the subject identified receptors. It is unlikely that these levels will be separately identifiable at such a distance but even these low levels will condition the hearing range of the occupants at the identified receptors.

There are some local residences identified as the receptors whose occupants have also been consulted as part of the planning process. No objections were received during the statutory consultation period and no comments have been made at any other date in the past. These dwellings comprise the former farmstead known as Arbour Farm and include six properties and one annexe. Table 1 below indicates the receptor properties, distance from the subject source, direction from source and five year average percentage of wind share :

Table 1

Receptor address	Distance from source	Direction of source	Average wind share
Arbour Farm	200 m	South East	2.25%
Arbour Court	200 m	South East	2.25%
Arbour Cottage	200 m	South East	2.25%
Arbour Croft	200m	South East	2.25%
Arbour Fold	200 m	South East	2.25%
Arbour Barn	200 m	South East	2.25%
Arbour Barn Annexe	200 m	South East	2.25%

3.0 Methodology

3.1 Assessment of background noise sources

The identified receptors are all located immediately adjacent to the unclassified road Elm Brow also known as Chipping Road. This road has already been discussed as a major source of background noise both during the day and intermittent noise at night. Peak traffic flows are one vehicle every 12 to 14 seconds and predicted to increase to one every 11-12 seconds by 2025. Typical traffic noise is at levels of 48.9 LAeqT to 58.9 LAeqT (typical maximum 71.8 LAFmaxT[1]). Details of the background noise from the road are included in Appendix II.

The main wind directions are west through to south being 60% of the average wind directions over a five year period. To a limited extent this carries the background noise of other livestock farms. During the summer months receptor occupiers are more likely to be out in their gardens. This will condition the hearing of the occupiers at the receptor locations. The meteorological wind from the south west is dominant but this is added to by the regular sea breeze effect from the west and the valley wind effect drawing air into the Hodder Valley. Image 1 shows the local wind rose data on an annual five year average. Meteorological data is set out in Appendix I

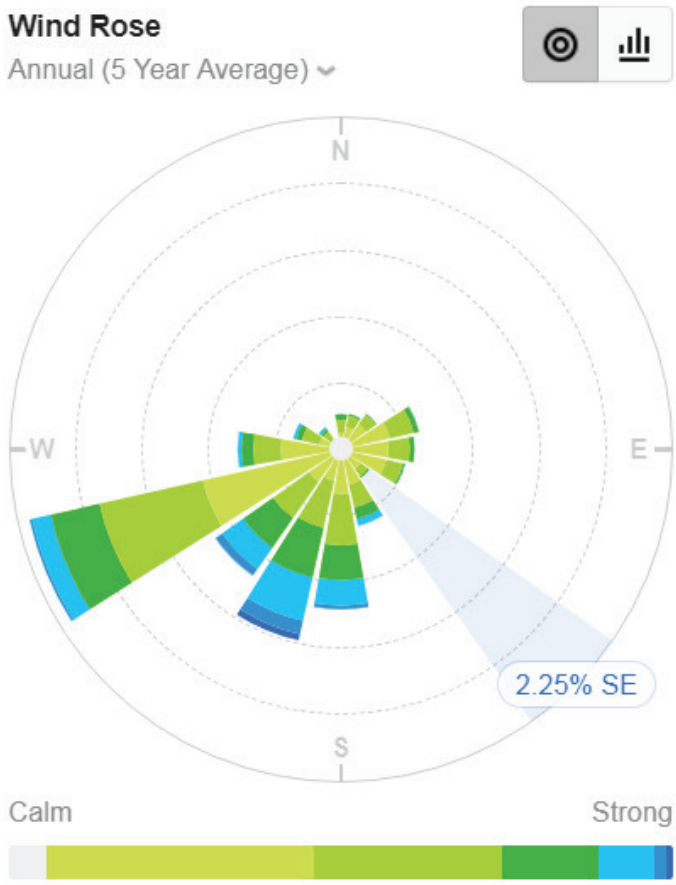


Image 1

The south east (2.25%) direction is unlikely to remain established for more than the morning period due to the wind effects described above. The existing background levels at source from the subject farm are set out in Table 2 below. These levels have been modelled to reduce significantly to acceptable levels in the 200 metres distance to the identified receptors.

Table 2

Existing Livestock Buildings	Noise emission data	Emission source data dB	Distance to receptors m	Receptor data dB
Existing livestock night	389	37	200	-2
Existing livestock day	389	52	200	2
intermittent daytime operations feeder & additional tractor	1 1	84 80	200 200	3 3

The existing source buildings and cattle numbers have been in place since 2014 so there has been a four year period of full operational capacity. Part background source numbers of livestock in Table 2 comprises livestock which are proposed to be relocated to occupy the building extensions currently being considered. These numbers are also reflected at the proposed location in the subject noise sources Table 3. There have been no comments or complaints which substantiates the model being accurate for the sensitivity of the current occupiers at the identified receptors. The background noise levels of the road during the day essentially dominate the hearing range. The distance from the subject source reduces the average low activity level noise from source to below audible levels during the night. There are unlikely to be impulsive, intermittent or other additional noise levels from source at night.

The operation of tractors and machinery for feeding the cattle in the buildings is operated in a manner and at noise levels well below the thresholds for Noise at Work Regulations and comply with health and safety at work. Typically a tractor in the process of delivering the feed in the buildings operates at low to average revolutions and power output.

The total background noise levels from sources including the existing livestock buildings have attenuated to negligible levels on reaching the receptors. Such levels are well below the DEFRA published figures for acceptable levels. It should be noted that this type of livestock enterprise is not uncommon in the locality so would not be easily identifiable, as would a single pig enterprise for example. The background levels will be referred to again in the conclusion where the overall cumulative effect will be appraised.

3.2 Assessment of subject noise sources

As in the modelling of the background sources meteorological data is important to consider. The chances are low for a directional match to affect the receptors which are all in a narrow wind sector. Image 2 below shows the south east sector wind required to cause any effect which can reasonably be modelled in the selected direction. It is clear that a five year average of 2.25% amounts to a number of part days or eight days per annum. Predominant wind directions enhance the high levels of background noise from the two way traffic on Elm Brow (Chipping Road).

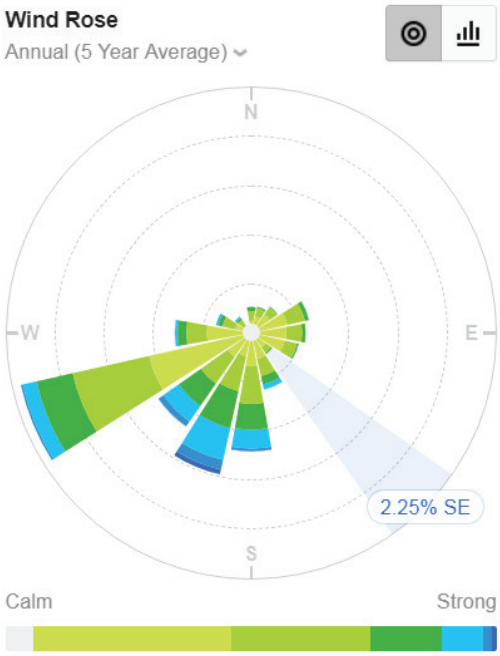


Image 2

The subject noise sources include two livestock buildings where the cattle numbers are anticipated to increase over the next twelve months. A number of heifers will enter the herd over and above the cull rate requiring the two buildings already approved. These numbers and areas are shown red in Table 3 and Table 4 below. This comprises the cumulative effect this report is seeking to identify.

Table 3 Daytime data

Livestock Building	Cattle data	Noise Emission data (dB)	Distance to receptors	Attenuated Receptor data (average dB)
3/2018/0124 (approved)	56	52	200	1
3/2018/0151 (approved)	56	52	200	1
3/2018/0374 (extends 0124)	56	52	200	1
3/2018/0376 (extends 0151)	56	52	200	1

Table 4 Night time data

Livestock Building	Cattle data	Noise Emission data (dB)	Distance to receptors	Attenuated Receptor data (average dB)
3/2018/0124 (approved)	56	37	200	-2
3/2018/0151 (approved)	56	37	200	-2
3/2018/0374 (extends 0124)	56	37	200	-2
3/2018/0376 (extends 0151)	56	37	200	-2

It is understood that the dairy herd on the holding and in the subject buildings is managed to a high standard by a conscientious team. The day to day tasks are carried out with attention to detail and in a calm manner by the operators. As the dairy cattle are handled without stress two to three times each day they are by nature calm and quiet with a constant feed source. When housed in the buildings a full diet feed mix is provided each day and topped up to appetite. As such each cow has a constant supply of high energy forage, fodder or feed within a few paces of their individual bed space. The proposed stocking rate of the new and proposed buildings will be maintained at 90% occupancy to provide spare beds which reduces stress levels amongst cows looking for a space. All considered this herd appears to be contented and well managed with particularly low levels of sound levels emitted especially at night, unlike some example herds of beef cattle.

Assumptions include :

No reflections of sound – not applicable (these could be 3dB)
Distance Correction - sound levels halve by distance doubled
Atmospheric Attenuation – meteorological effects have been taken into account
Ground Attenuation – applied as predominantly level land without significant barriers
Shielding Correction 1 – new subject sources will have no shielding from other significant barriers
Shielding Correction 2 - subject background building sources will potentially have some shielding
Shielding Correction 3 - 0376 and 0151 will provide some shielding to 0374 and 0124

4.0 Discussion of Results

The relatively modest expansion of the cattle herd can be quantified by the 15% increase in mature cattle numbers, a 24% increase in building area but no significant increase in sound levels at key receptors. Key to the assessment of calculated cumulative effect is the attenuation rate which assists in significantly reducing noise levels by the 200 metres distance from source. Table 1 showed all of the identified receptors to be 200m from the subject source and Image 2 shows meteorological effects at 2.25% of possible directional inputs.

At some distance from a source it would be unusual if noise levels remained constant for an hour and in reality, short term fluctuations of background noise are observed. Therefore, although average sound levels experienced may be below the detection threshold the receptors may be exposed to short term lived periods of low level sound which are higher than the minimal hourly average.

The highest calculated Assessment Levels at any of the nearest dwellings during the day, evening 1dB and night are -2dB respectively. Where the Rating Level is at parity with the background, BS4142 states that the Specific Level will have a low impact. On this basis it is concluded that the aggregate cumulative noise impact of all the existing and proposed cattle buildings discussed in this report will be low to very low. During the night it is reasonable to assume that the occupiers of the nearest dwellings will be within their houses. A room with an open window will provide 10 – 15dB sound reduction. For a room facing the proposed development in the dwellings exposed to the maximum above background noise would result in noise ingress of 4dB; this would be inaudible.

5.0 Conclusions

Noise levels from the existing and proposed livestock buildings have been assessed and quantified based upon attenuation that takes into account the likely source levels and sound insulation effect of the buildings. The sound levels at the identified receptors have been assessed against the background noise levels in the immediate area.

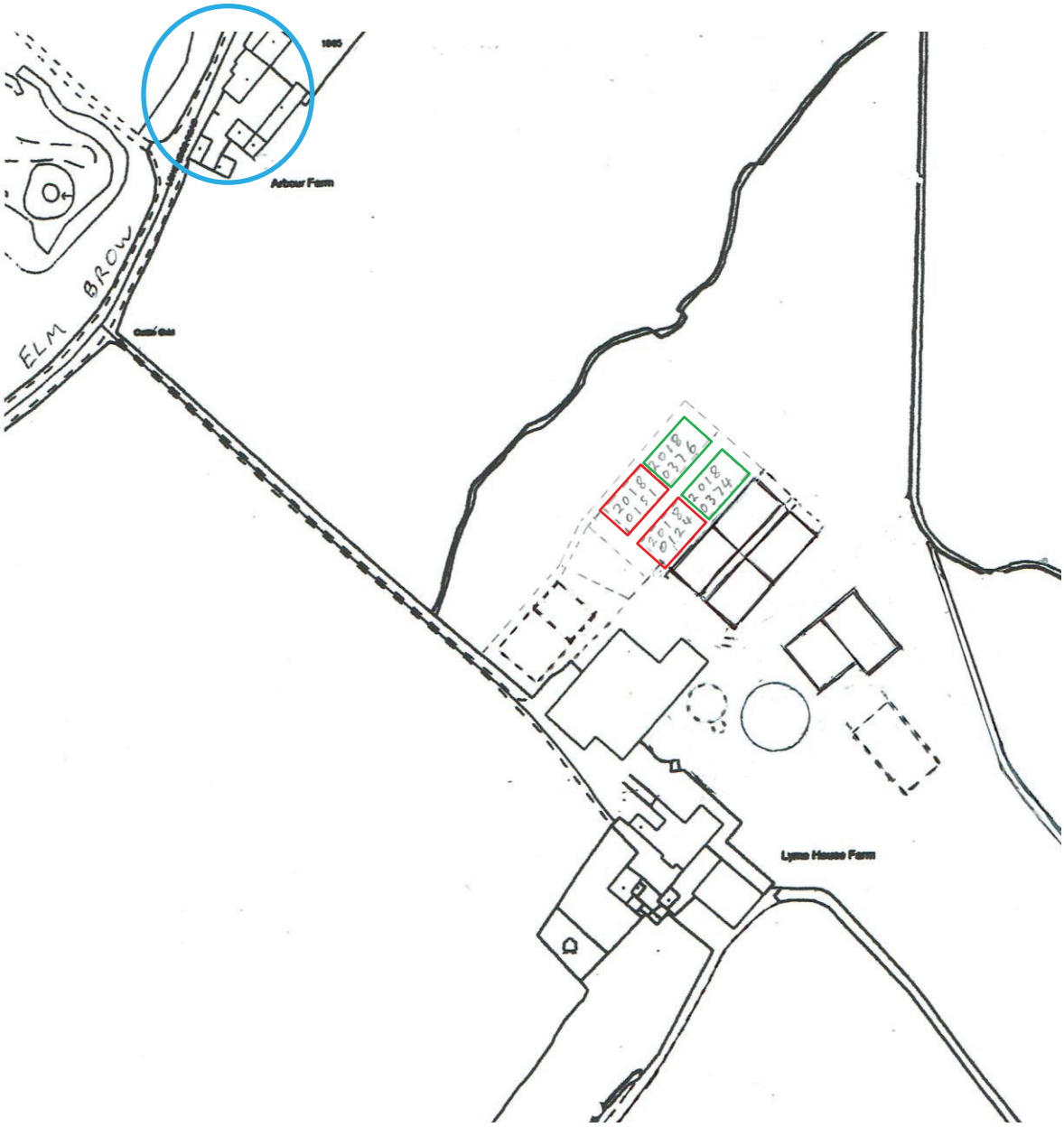
The background levels have been assessed and taken into consideration with other local effects, including local meteorological conditions.

As requested a cumulative effect has been considered. While an average cumulative effect has been calculated at source there is no perceived effect at the distances of 200 metres from sources including at additional receptor locations.

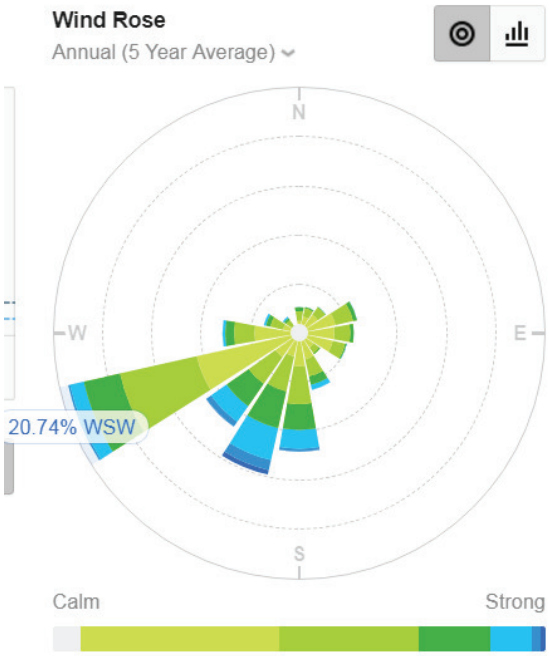
To conclude that at all of the six residential receptors considered, the predicted cumulative noise level exposures from the subject source would be minimal/ acceptable. These results indicate a negligible impact which is “not noticeable” or “noticeable”. So no mitigation is recommended nor would be required in this case.

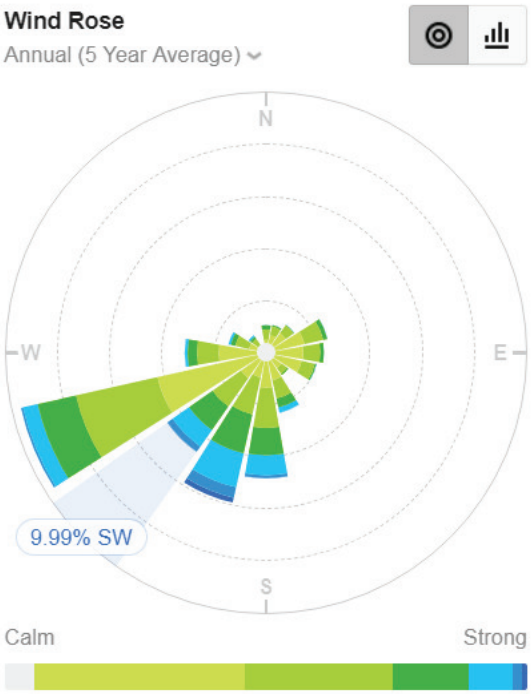
Plan of the receptor locations (blue), farm buildings source (red) and proposed extensions (green)

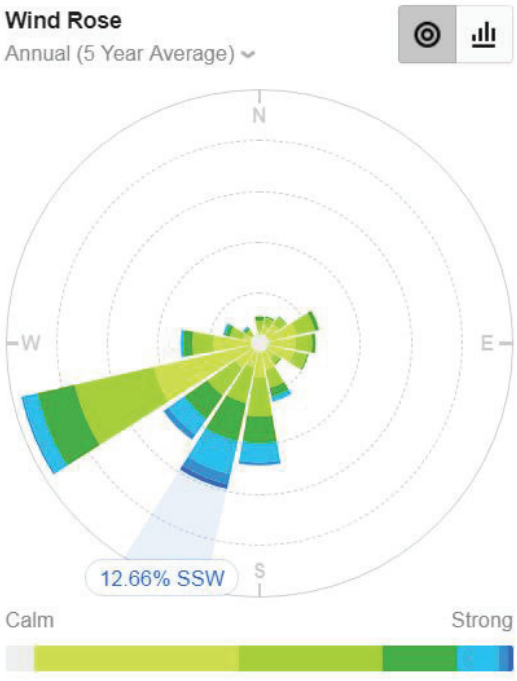
Scale 1 : 2500



Appendix I – Background Meteorological data, nearest location Chipping 2.5km

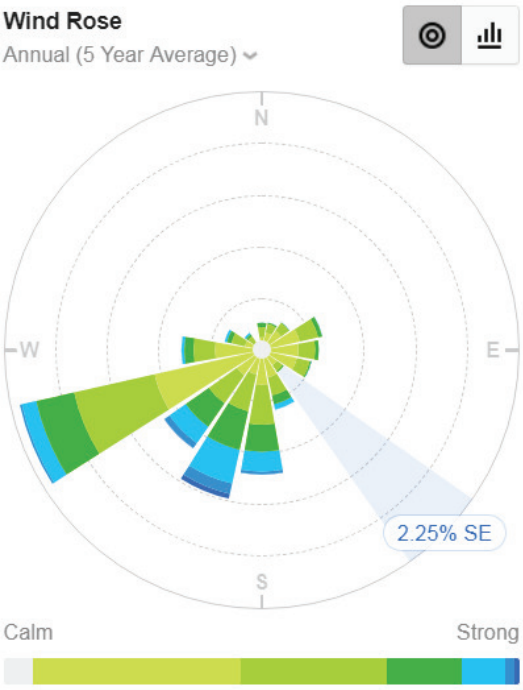


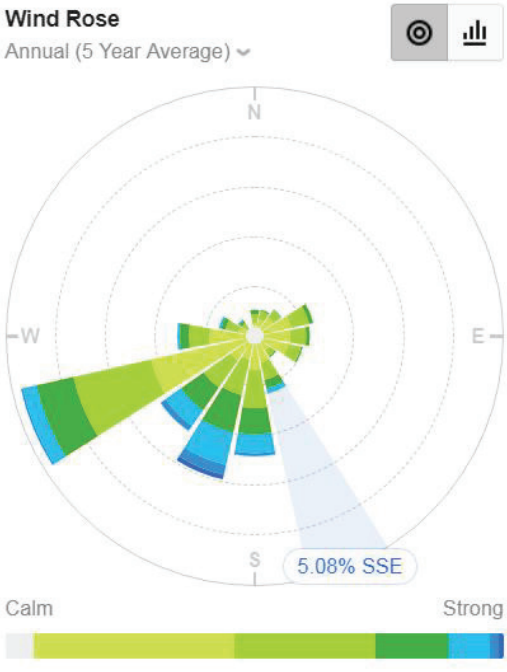


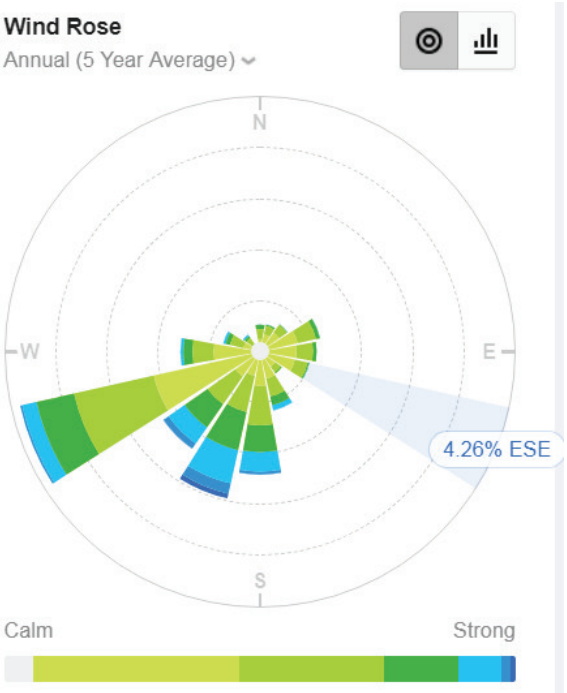


Appendix I –

Effect and Background Meteorological data, nearest location Chipping 2.5km







Appendix II –

Background noise data (predominantly from traffic flow on Chipping Road) adjacent to identified receptor (residential dwellings)

Background data	Time period	Number of hours	Noise levels
Daytime	0700 to 2300	16 hours	58.9 LAeqT
Night time	2300 to 0700	8 hours	48.9 LAeqT
Typical Maximum			71.8 LAFmaxT[1]

Proposed Sensitive Receptor Location	Location	Period	Predicted Noise Level, $L_{Aeq,T}$	Predicted Maximum Noise Level, L_{AFmax}
Residential Properties in the Western Part of the Site, i.e. nearest to Chipping Lane	Garden	Daytime – 16 Hour	49.0	-
	Façade		56.5	-
	Façade	Night-time – 8 Hour	49.5	68.0 [2]

Peak Traffic Flows

	Time period	Traffic to Longridge	Traffic to Chipping	Total for time period	Typical time interval
Daytime	0800 -0900	174	108	282	12 seconds
Night	1700 - 1800	99	156	255	14 seconds

Peak Traffic Flows predicted for 2025

	Time period	Traffic to Longridge	Traffic to Chipping	Total for time period	Typical time interval
Daytime	0800 -0900	196	122	318	11 seconds
Night	1700 - 1800	112	177	289	12 seconds

The residential receptor development may have been exposed to existing noise. The planning application should have included proposals to achieve the following noise levels in habitable rooms and outdoor areas. These levels are based on “good” internal noise levels for bedrooms and “reasonable” internal noise levels for living rooms, as set out in the relevant British Standard at that time, and for more recent changes as set out in BS8233 2014

Time Area Maximum noise level Daytime noise 07:00 – 23:00 Living rooms 40 dBLAeq (16hr) Outdoor amenity 55 dBLAeq (1hr) Night time noise 23:00 – 07:00 Bedrooms 30 dBLAeq (8hr) 45 dBLAmax.

These levels must have been achieved with windows open. For the purposes of calculation and unless specific window attenuation calculations were provided, noise reduction through a partially open window should be assumed to be 15dBA.