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Fullabrook Wind Farm -
Post Construction Noise Compliance Assessment -

Report HM:2467/R2 -

28th September 2012 -

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FULLABROOK WIND FARM

POST CONSTRUCTION NOISE COMPLIANCE ASSESSMENT

REPORT HM: 2467/R2,

28th September 2012

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1. - INTRODUCTION

1.1 - Hayes McKenzie was commissioned to carry out noise monitoring at a number of residential properties around the Fullabrook wind farm site as required by the Planning Conditions relating to noise.

1.2 - The Planning Conditions relating to noise from Fullabrook Wind Farm require the measurement of operational noise at up to 5 measurement locations following commencement of operation of the site. Operational noise measurements have however been carried out at 12 properties surrounding the site following consultation with North Devon Council.

1.3 - All measurement locations (including the specific siting of the equipment at each location) were agreed with the Council. Measurements of overall noise level were carried out for a sufficient length of time to ensure an adequate amount of broadband noise data was collected before the measurement equipment was removed with the prior agreement of North Devon Council.

1.4 - The noise data has been analysed according to the protocol agreed with the Council prior to operation of the wind farm, and the results have been compared against the noise limits set out in the Planning Conditions for the site.

1.5 - The Planning Conditions require an assessment of tonal noise from the wind farm. Audio recordings were carried out at 4 locations, agreed with the Council, such that the contribution of such noise to the measured levels could be quantified.

2. - PLANNING CONDITIONS

2.1 - Planning condition 20 states that, for financially uninvolved properties;

'The levels of noise resulting from the combined effects of the wind turbines on the development site when corrected in accordance with Notes A and B below shall not exceed the following limits at any dwelling existing at the date of this permission:

Between the hours 2300 – 0700

The greater of 43dB $L_{A90,10min}$ or 5dB L_{A90} above the established nighttime background noise level at that property.

At all other times

The greater of 40dB $L_{A90,10min}$ or 5dB L_{A90} above the established quiet daytime background noise level at that property.'

2.2 - The condition then goes on to clarify the assumed background noise levels for the purposes of compliance at 13 properties in the vicinity of the wind farm as follows:

Table 1 – Background Noise Levels from Condition 21

Location		10m height wind speed								
		3	4	5	6	7	8	9	10	11
Fullabrook	daytime	33	33	34	34	35	36	37	38	39
	night-time	33	33	34	34	35	36	37	38	39
Halsinger	daytime	30	32	33	35	36	37	38	38	39
	night-time	30	32	34	35	36	37	37	37	37
Crackaway	daytime	32	33	35	36	36	37	37	38	40
	night-time	33	35	36	37	37	37	37	37	38
Burland Farm	daytime	34	35	36	36	36	37	38	39	41
	night-time	35	36	37	38	38	38	38	38	40
South Burland	daytime	38	38	38	37	37	38	40	40	40
	night-time	35	36	36	37	37	37	38	39	41
Lower Metcombe	daytime	35	36	36	36	36	37	39	40	40
	night-time	33	35	36	36	37	37	37	37	38
Ash Barton	daytime	32	34	35	37	38	38	39	40	39
	night-time	32	34	35	36	37	37	38	38	38
Patsford	daytime	35	35	35	35	36	38	40	40	40
	night-time	33	34	35	36	36	37	37	37	37
Beara Charter	daytime	34	35	36	36	37	38	38	39	39
	night-time	34	35	36	36	37	38	38	39	39
Luscott Barton	daytime	33	35	36	36	38	39	40	40	40
	night-time	33	35	36	36	37	37	37	37	38
Northleigh	daytime	31	32	34	35	35	36	36	36	37
	night-time	30	32	33	34	35	35	36	36	37
Pippacott	daytime	36	36	36	37	37	37	37	38	37
	night-time	35	35	35	35	36	37	38	38	38
West Stowford Barton	daytime	35	35	35	36	39	40	40	40	40
	night-time	34	35	36	37	37	38	38	38	38

It further states that:

Where there is no background noise data for any specific property then the background noise data shall be taken from the nearest property for which such data is available.

2.3 - Condition 21 requires a methodology to be agreed with the local planning authority for monitoring noise levels. This methodology is detailed in Hayes McKenzie document *Fullabrook Wind Farm – Noise Compliance Measurement Protocol*, dated 2nd of June 2011 (included at Appendix A) and all measurements and analysis presented in this report have been carried out in accordance with this methodology.

3. - NOISE MONITORING

3.1 - Noise measurements were carried out at 12 residential locations. The noise measurement locations and exact positioning of the noise monitoring equipment were agreed with North Devon Council and the Council's noise consultants RD Associates. Noise monitoring equipment was only removed from the measurement locations once agreement had been reached with the Council that enough broadband[1] noise data had been collected.

3.2 - A summary of the noise measurement locations and duration of measurements at each location are detailed below at Table 2 with the noise monitoring locations shown at Figure 1.

Table 2 – Noise Measurement Locations

Location ID	Location Name	Monitoring Start Date	Monitoring End Date	Number of Weeks of Data Available
1	Binalong	20/02/2012	31/05/2012	12
2	Crackaway	20/02/2012	17/04/2012	8
3	Burland Farm	20/02/2012	31/05/2012	14
4	Metcombe	20/02/2012	17/04/2012	8
5	Northleigh	20/02/2012	31/05/2012	14
6	Greenhill	20/02/2012	17/04/2012	8

[1] Audio recordings and tonal assessment are considered separately

6a	Greenhill Alternative[2]	05/03/2012	17/04/2012	6
7	Patsford	20/02/2012	31/05/2012	14
8	Fullabrook	20/02/2012	31/05/2012	14
9	Halsinger	20/02/2012	31/05/2012	14
10	Beara	20/02/2012	31/05/2012	14
11	Pippacott	20/02/2012	17/04/2012	8
12	Luscott	20/02/2012	17/04/2012	6

3.3 - Each measurement location was visited approximately every 2 weeks, where the data was downloaded and the equipment calibration checked and reset as necessary.

Noise Monitoring Equipment

3.4 - Noise measurements were carried out using either Larson Davis 820 sound level meters (SLMs), or Rion NL-52 SLMs. The microphones were fitted with a 45mm radius foam ball windshield surrounded by a secondary windshield of 40mm thickness (based on recommended design specifications within ESTU W/13/00386/REP, *Noise Measurements in Windy Conditions)* and mounted on a tripod at a height of approximately 1.2 metres. All equipment was within its relevant laboratory calibration period, it was calibrated on-site at installation, and calibration was carried out at each subsequent visit to site.

Rainfall

3.5 - Rainfall was measured at a number of locations around the site for the dates detailed at Table 3. This data is considered representative of rainfall at all measurement locations. Periods where rainfall was detected at any of the measurement locations have been excluded from the analysis as described at Appendix A.

Table 3 – Rainfall Measurement Locations and Dates

Location	Start Date	End Date
Crackaway	20/02/2012	17/03/2012
Patsford	20/02/2012	28/8/2012
Luscott	20/02/2012	17/03/2012
Burland Farm	17/04/2012	30/05/2012

[2] This additional measurement location at Greenhill on the north side of Metcombe Lane was included at the request of the residents

Figure 1 – Noise Measurement Locations -

Wind Data

3.6 - Wind speed and direction data was taken from the on-site meteorological mast, which has anemometers installed at heights of 65, 63, 50, 33, and 10m and wind vanes at heights of 63 and 33m. For the purposes of the compliance measurements, noise measurements were referenced to the measured 10m-height wind speed as required by the planning conditions on noise. The 63m-height wind direction was used to determine the downwind angles for inclusion in the analysis.

Measurement of Background Noise Levels

3.7 - A series of wind farm shut-downs were carried out so that the contribution of background noise to the measured levels could be assessed and the appropriate correction applied to the measured noise levels. Wind farm shut down periods were scheduled to occur between 2200-0000 hours until such time as adequate background noise data had been collected. This enables background noise data to be collected for both the daytime and night time periods during one shut down period.

3.8 - It should be noted that the evening shut down period of between 2200-2300 hours usually represents the quietest portion of the daytime period, and therefore any correction applied to the evening measured noise levels is therefore done so on a worst-case basis.

Tonal Noise Measurements

3.9 - Audio recordings were carried out a number of properties, agreed with North Devon Council, to quantify tonal noise from the wind farm. The measurements were carried out at the properties detailed at Table 4 below.

Table 4 – Audio Measurement Locations and Dates

Location	Start Date	End Date
Binalong	20/02/2012	31/05/2012
Crackaway	20/02/2012	17/04/2012
Beara	20/02/2012	31/05/2012
Patsford	31/05/2012	28/08/2012

3.10 The audio measurements at Patsford were carried out at the request of the Council following -

the conclusion of the noise monitoring at all other locations. A rain gauge was installed at Patsford for the duration of the audio measurements.

3.11 - The audio measurements carried out at Binalong, Crackaway, and Patsford consisted of 1-minute of audio recording every 10-minutes, and at Patsford the meter was set up to record 2-minute in every 10-minutes. The Conditions require the assessment of tonal noise according to the procedure detailed in ETSU-R-97 which requires analysis of 2-minutes audio, however it was not possible to set up the equipment to do this at the original 3 audio assessment locations, and it was agreed, with the Council's noise consultants, that the analysis would be carried out on the basis of the 1-minute audio for these locations. It is highly unlikely that this modification to the analysis would cause any significant difference in the results.

3.12 - Initial analysis of the audio data collected showed that the results were significantly affected by tonal noise sources not associated with the operation of the wind farm such as passing vehicles and animal noises. An analysis protocol was, therefore, formulated and agreed with the Council to ensure that periods analysis for the tonal noise assessment consisted of wind turbine noise and was not corrupted by noise not associated with the operation of the wind farm. The agreed analysis protocol is reproduced at Appendix B.

4. - ANALYSIS OF MEASURED NOISE DATA

4.1 - The results of the noise measurements at each location were filtered to include only periods where all turbines were operating normally; filtered to exclude periods where rainfall was measured; and to exclude periods between 0400-0700 hours where the influence of birdsong and vehicle activity on local roads may have affected the measured noise data.

4.2 - The downwind angle for each property was calculated according to the agreed methodology stated at Appendix A to ensure that periods where properties were upwind of the wind farm (when wind farm noise levels are likely to be at their lowest) were not included in the analysis and subsequent comparison with the noise limits.

4.3 - Data collected between 1800-2300 hours was used for assessment against the daytime noise limit to minimise the influence of sources of noise not associated with the wind farm. Where the prevailing noise level derived from data collected between the hours of 0700-2300 hours is

below the noise limit it can also be concluded that the daytime noise limit is met.

4.4 - Where it has not been possible to calculate the wind farm noise level from the prevailing operational and background noise levels, the calculated wind farm noise level has been extrapolated to higher wind speeds. The extrapolated wind farm noise levels are shown on the noise compliance assessment charts as dotted green lines.

4.5 - The noise limits for each property are detailed below at Table 5 below.

Table 5 – Noise Limits Derived from Condition 21

Property	Measured 10m-height W/S	3	4	5	6	7	8	9	10	11
Fullabrook Farm*	Daytime Noise Limit	45	45	45	45	45	45	45	45	45
	Night Noise Limit	45	45	45	45	45	45	45	45	45
Fullabrook Barton	Daytime Noise Limit	40	40	40	40	40	41	42	43	44
	Night Noise Limit	43	43	43	43	43	43	43	43	44
Halsinger	Daytime Noise Limit	40	40	40	40	41	42	43	43	44
	Night Noise Limit	43	43	43	43	43	43	43	43	43
Crackaway	Daytime Noise Limit	40	40	40	41	41	42	42	43	45
	Night Noise Limit	43	43	43	43	43	43	43	43	43
Burland Farm	Daytime Noise Limit	45	45	45	45	45	45	45	45	46
	Night Noise Limit	45	45	45	45	45	45	45	45	45
South Burland	Daytime Noise Limit	43	43	43	42	42	43	45	45	45
	Night Noise Limit	43	43	43	43	43	43	43	44	46
Metcombe	Daytime Noise Limit	40	41	41	41	41	42	44	45	45
	Night Noise Limit	43	43	43	43	43	43	43	43	43
Ash Barton	Daytime Noise Limit	40	40	40	42	43	43	44	45	44
	Night Noise Limit	43	43	43	43	43	43	43	43	43
Patsford	Daytime Noise Limit	40	40	40	40	41	43	45	45	45
	Night Noise Limit	43	43	43	43	43	43	43	43	43
Beara Charter	Daytime Noise Limit	40	40	41	41	42	43	43	44	44
	Night Noise Limit	43	43	43	43	43	43	43	44	44
Luscott Barton	Daytime Noise Limit	40	40	41	41	43	44	45	45	45
	Night Noise Limit	43	43	43	43	43	43	43	43	43
Northleigh	Daytime Noise Limit	40	40	40	40	40	41	41	41	42
	Night Noise Limit	43	43	43	43	43	43	43	43	43
Pippacott	Daytime Noise Limit	41	41	41	42	42	42	42	43	42
	Night Noise Limit	43	43	43	43	43	43	43	43	43
West Stoford Barton	Daytime Noise Limit	40	40	40	41	44	45	45	45	45
	Night Noise Limit	43	43	43	43	43	43	43	43	43

4.6 - A series of 7 noise assessment charts were produced for each measurement location with the details of each chart shown at Table 6 below.

Table 6 – Charts Produced for Noise Compliance Assessment

Chart Number	Information Included on Noise Compliance Assessment Charts
1	• Night Noise Limit • Downwind Measured Operational Night Noise Levels (2300-0400 hours) • Derived Prevailing Measured Noise Level • Downwind Measured Shut Down Noise Levels • Derived Prevailing Shut Down Noise Level • Night Calculated Turbine Noise Level
2	• Night Noise Limit • Downwind Measured Operational Night Noise Levels (2300-0400 hours) • Derived Prevailing Measured Noise Level • Measured Shut Down Noise Levels (not downwind filtered) • Derived Prevailing Shut Down Noise Level • Night Calculated Turbine Noise Level
3	• Daytime Noise Limit • Downwind Measured Operational Evening Noise Levels (1800-2300 hours) • Derived Prevailing Measured Noise Level • Downwind Measured Shut Down Noise Levels • Derived Prevailing Shut Down Noise Level • Evening Calculated Turbine Noise Level
4	• Daytime Noise Limit • Downwind Measured Operational Evening Noise Levels (1800-2300 hours) • Derived Prevailing Measured Noise Level • Measured Shut Down Noise Levels (not downwind filtered) • Derived Prevailing Shut Down Noise Level • Evening Calculated Turbine Noise Level
5	• Daytime Noise Limit • Downwind Measured Operational Daytime Noise Levels (0700-2300 hours) • Derived Prevailing Measured Noise Level • Downwind Measured Shut Down Noise Levels • Prevailing Measured Shut Down Level
6	• Downwind Measured Operational Noise Levels (All data, rain excluded) • Derived Prevailing Measured Noise Level • Downwind Measured Shut Down Noise Levels • Prevailing Measured Shut Down Level
7	• Measured Operational Daytime Noise Levels (all hours and wind directions) • Measured Shut Down Noise Levels (all hours and wind directions) • Measured Rainfall Affected Noise Levels (all hours and wind directions)

4.7 - The difference between Charts 1 and 2 is that the measured shut-down noise data was filtered for wind direction (in the same way as the operational data) for Chart 1, but shut-down data for all wind directions was included in Chart 2 in order to fill any gaps in the wind direction filtered measured shut-down data. The difference between Charts 3 and 4 is the same, but for the evening hours.

4.8 - Chart 5, which shows all daytime measured noise data against the daytime noise limit,

demonstrates, where necessary, that if the polynomial regression curve through the data is below the daytime noise limit, the daytime noise limit can be deemed to have been met. The all daytime data (comprising 0700-2300 hours) contains measured noise levels which are likely to be affected by noise sources other than those associated with operation of the wind farm.

4.9 - Charts 6 and 7 are included to show all measured data collected for downwind filtered wind conditions and for non-wind direction filtered conditions respectively, and show all the noise data measured during the noise measurement campaign.

5. - RESULTS

5.1 - The results of the noise measurements are shown at Appendix C, which graphically detail the information described at Table 6 above for each measurement location. The results are summarised in tabular form at Table 7 below, which shows the margin between the calculated turbine noise level (background/shut-down prevailing measured noise level subtracted from prevailing measured operational noise level) and the noise limit. The results presented at Table 7 show the worst case results from Charts 1 and 2, and Charts 3 and 4, for each property. Where the wind farm noise levels were above the noise limit the cells are highlighted in red.

Table 7 –Noise Compliance Assessment Results (dB)

Property	Measured 10m-height Wind Speed (m/s)	3	4	5	6	7	8	9	10	11
Binalong	Night Limit Met By	11.9	9.9	7.5	5.1	3.3	2.4	2.7	4.5	4.5
	Day Limit Met by	5.7	3.6	1.9	0.6	-0.3	0.0	-0.4	-0.8	-0.9
Crackaway	Night Limit Met By	17.7	13.4	9.3	6.1	4.7	4.7	4.7	4.7	4.7
	Day Limit Met by	11.8	8.8	5.8	4.3	2.3	2.3	2.3	3.3	5.3
Burland	Night Limit Met By	10.1	7.5	4.6	2.1	0.3	-0.6	-0.6	-0.1	0.9
	Day Limit Met by	8.5	6.4	4.7	3.1	1.4	-0.2	-1.5	-1.9	-0.8
Metcombe	Night Limit Met By	12.7	10.2	7.6	5.3	3.2	1.5	0.2	-0.5	-0.5
	Day Limit Met by	7.4	6.6	5.1	3.8	2.6	2.5	3.3	3.3	2.6
Northleigh	Night Limit Met By	16.9	13.9	10.3	6.8	4.1	2.5	2.4	2.4	2.4
	Day Limit Met by	11.6	9.3	7.0	4.7	2.4	1.5	0.1	-0.1	0.9
Greenhill	Night Limit Met By	21.9	17.5	13.6	10.4	8.2	6.9	6.6	7.5	7.5
	Day Limit Met by	10.9	9.9	9.2	8.3	6.9	6.1	4.3	3.5	4.5
Greenhill Alternative	Night Limit Met By	20.4	16.4	12.3	8.9	6.7	5.7	5.7	6.2	6.2
	Day Limit Met by	12.0	9.7	8.1	7.1	6.2	5.9	3.3	3.3	4.3
Patsford	Night Limit Met By	11.2	8.9	6.4	4.0	1.9	0.3	-0.3	0.8	0.8

	Day Limit Met by	6.1	4.2	2.4	0.9	0.6	1.5	2.6	2.2	2.7
Fullabrook	Night Limit Met By	12.8	9.2	5.7	3.1	1.8	1.6	1.6	1.6	2.6
	Day Limit Met by	7.2	4.9	3.6	2.3	1.1	0.8	0.4	1.4	2.4
Halsinger	Night Limit Met By	14.2	11.1	8.7	6.6	4.9	3.6	2.7	2.7	2.7
	Day Limit Met by	9.9	8.4	6.6	4.5	3.3	2.1	0.6	0.6	1.6
Beara	Night Limit Met By	13.1	10.3	7.3	4.9	3.1	2.1	1.9	3.3	3.3
	Day Limit Met by	6.6	4.5	3.5	1.8	1.4	1.4	0.9	2.6	2.6
Pippacott	Night Limit Met By	18.3	15.0	11.3	7.9	5.1	3.3	2.6	3.4	3.4
	Day Limit Met by	11.2	8.8	6.7	5.9	4.2	2.7	1.6	1.9	1.0
Luscott Barton	Night Limit Met By	16.7	12.1	7.8	4.4	2.3	1.6	2.0	2.3	2.3
	Day Limit Met by	6.7	4.4	3.6	2.2	3.0	3.3	4.1	4.5	4.5

Discussion

5.2 - The results of the noise measurements shown at Appendix C and Table 7 show that there were certain conditions where wind farm noise levels were shown to be above the noise limits at 5 properties. It should be noted that these measured levels above the noise limits only occur for a small range of wind speeds and conditions when the measurement locations were downwind of the wind farm. For wind directions other than downwind, it can be expected that wind farm noise levels would be lower.

5.3 - As stated at paragraph 3.8 the evening shut down period is likely to be representative of the quietest daytime (0700-2300 hours) noise levels, and that the rest of the evening (and daytime) measurement periods are likely to be affected to a greater degree by noise sources other than wind farm noise. The resultant calculated wind farm noise levels are therefore likely to be an over-estimate of the actual wind farm noise levels.

5.4 - At Binalong it can be seen at Appendix C and Table 7 that derived evening wind farm noise levels at Binalong were shown to be above the daytime noise limit at higher wind speeds. It can be seen from Hayes McKenzie report HM:2195/R1, *Predictions and Assessment for Compliance wind Planning Conditions*, which specifies the required mitigation for Fullabrook wind farm, that a greater amount of mitigation is in place for the turbines nearest Binalong during the daytime than at night. Since the turbines can therefore be assumed to be quieter during the day than at night, it can therefore be inferred that if the night time wind farm noise levels are below the daytime noise limit, the daytime noise limit can be deemed to have been met. No additional mitigation is therefore proposed specifically for Binalong, as the noise limits

are deemed to have been met.

5.5 - At Burland Farm, it can be seen at Appendix C and Table 7 that the higher financially involved daytime and night time noise limits are almost identical (they only differ by 1dB at 11m/s). It is likely that the apparent exceedence of the day-time noise limit is a result of the unrepresentatively low background noise (from 2200-2300 hours). It therefore follows that if the night noise limit is met, the same mitigation should ensure that the daytime noise limit is also met. Where the additional mitigation required has been calculated based on the measured exceedance of the night time noise limit, it has been assumed that implementing this mitigation during the daytime will also ensure that the daytime noise limit is met.

5.6 - Compliance with the limits is therefore achieved at 8 out of the 12 measurement locations. There are therefore 4 remaining properties; Burland Farm, Metcombe, Northleigh and Patsford, where additional mitigation is required to ensure that the noise limits are met which, we are informed, will be implemented by 7th of October 2012.

Tonal Analysis Results Discussion

5.7 - Early indications from the tonal noise analysis show that, at low and high wind speeds, a level of tonal audibility requiring a tonal penalty was measured at all locations, and at the mid-range of wind speeds the tonal audibility decreased.

5.8 - The calculated tonal penalty has not been added to the measured broadband noise levels, and the results have been sent to the turbine manufacturer for further investigation. This data is currently being investigated by the manufacturer with the intention that the tonal audibility is reduced.

5.9 - It appears that the level of tonal noise from the turbines may be dependent on the mode of operation of the turbines and, therefore, the tone levels may change with the additional mitigation to be implemented as a result of this noise compliance assessment. Further tonal noise measurements will be carried out when additional compliance measurements are carried out to ensure that the updated mitigation leads to the wind farm operating within its noise limits.

6. - MITIGATION

6.1 - Up to the date of this report, the wind farm has been operating within a pre-defined mitigation regime whereby specific wind turbines are configured to operate in reduced modes of operation, under certain conditions, in order to reduce the noise output. Updated mitigation has been calculated to ensure that the noise limits will be complied with based on the results of the noise compliance measurements. We are informed that this will be implemented by the 7th of October 2012.

6.2 - In order to calculate the required updated mitigation, the approach has been to effectively reduce the noise limits by the exceedance amount (detailed at Table 7), plus an additional 1 dB (to add an additional safety margin into the updated mitigation regime). The updated noise limits, together with the updated noise predictions calculating the additional mitigation required are shown at Appendix D. The assumptions used in the predictions and assessment are based on those used in Hayes McKenzie report HM:2195/R1, *Predictions and Assessment for Compliance wind Planning Conditions*, although the downwind and upwind angles from the turbines has been increased to +/-75° (rather than +/-45° used originally) as a slightly more conservative approach.

6.3 - It should be noted that the same wind shear assumptions as in report HM:2195/R1 have been incorporated into the noise assessment charts shown at Appendix D. It should be noted that the noise assessment charts show the predicted noise level for the wind direction with the highest predicted level. For all other wind directions, predicted noise levels are lower.

6.4 - Additional mitigation has been specified to cover the range of wind speeds and directions where measured levels in excess of the noise limits have been shown. The adjustments made to the noise limits to calculate the updated mitigation result in the noise limits reducing at a particular range of wind speeds and then increasing back to the original noise limit. The mitigation specified for hub height wind speed has therefore incorporated average +/-1 standard deviation of the wind shear detailed in report HM:2195/R1 (which only needed to include +1 standard deviation), to ensure that the updated mitigation includes the on-site variability of wind shear.

6.5 - The updated mitigation required for each turbine is detailed at Appendix E, and will be applied

to the wind turbines specified to ensure that the wind farm will operate within the noise limits specified in the Planning Conditions.

7. - FURTHER MEASUREMENTS

7.1 - A further round of noise compliance measurements will be carried out at the properties where wind farm noise levels were found to be in excess of the noise limits to ensure that the updated mitigation regime enables the wind farm to operate within the noise limits.

7.2 - As part of the further noise measurements, audio recordings will be carried out so that further tonal analysis can be performed to ensure that tonal noise from the wind farm has been controlled and does not cause the noise limits to be exceeded.

8. - CONCLUSIONS

8.1 - The Planning Conditions relating to noise from Fullabrook Wind Farm require the measurement of operational noise at up to 5 measurement locations following commencement of operation of the site. Operational noise measurements were carried out at 12 properties surrounding the site following consultation with North Devon Council.

8.2 - The noise data has been analysed according to the protocol agreed with the Council prior to operation of the wind farm, and the results have been compared against the noise limits set out in the Planning Conditions for the site.

8.3 - The results of the analysis showed that wind farm noise levels were below the specified noise limits at 8 of the 12 measurement locations. Of the remaining 4 measurement locations, results for the 3 locations that are not financially involved with the wind farm showed noise levels above the noise limit by a maximum of 0.5dB for a 1m/s range of wind speed.

8.4 - Additional mitigation has been specified to ensure that the wind farm operates within the noise limits specified within the Planning Conditions. We are informed that this will be implemented by 7th of October.

8.5 - The Planning Conditions require an assessment of tonal noise from the wind farm. Audio recordings were carried out at 4 locations, agreed with the Council, such that the contribution of such noise to the measured levels could be quantified. The results showed that tonal noise from the wind farm requiring a tonal penalty was measured and we understand that the cause of the tonal noise from the wind turbines is currently under investigation by the turbine manufacturer.

8.6 - Further noise compliance measurements will be carried out once the specified additional mitigation has been implemented to establish that the wind farm will then be operating within the noise limits specified within the Planning Conditions. The further measurements will include audio measurements to allow tonal noise from the wind farm to be quantified with intention that tonal content will have been minimised such that any necessary correction does not cause the corrected noise levels to exceed the planning limits.

Appendix A

Noise Compliance Measurement Protocol

FULLABROOK WIND FARM
NOISE COMPLIANCE MEASUREMENT PROTOCOL
Rob Shepherd, Hayes McKenzie Partnership Ltd
HM : 2195_6_RES : 2nd June 2011

1. The planning consent issued by the Secretary of State for Fullabrook Wind Farm contains four Planning Conditions covering noise issues (nos. 20 -23). This document describes the noise compliance assessment methodology required by condition 21, which states:

> *No wind turbine shall be operated on the site until a scheme has been submitted to and agreed with the local planning authority for monitoring noise levels at up to five selected residential locations (or at representative locations close to those properties, to be agreed with the local planning authority) during six months following connection to the electricity grid and full operation of all the turbines on the site. The duration of such monitoring shall be sufficient to provide comprehensive information on noise levels in a representative range of wind speeds and wind directions with all wind turbines operating. Monitoring shall be carried out in accordance with the approved monitoring scheme and the results provided to the local planning authority within four months of completion of the scheme.*

Noise Measurement Procedure

2. Values of the $L_{A90,10\text{-minute}}$ noise statistic will be measured at 5 residential properties to be agreed with the Environmental Health department of North Devon Council prior to the installation of the noise monitoring equipment. Measurements will be carried out using sound level meters of EN 60651/BS EN 60804 Type 1, or BS EN 61672 Class 1 quality (or the equivalent UK adopted standard in force at the time of the measurements) set up to measure using the fast time weighted response as specified in BS EN 60651/BS EN 60804 or BS EN 61672-1 (or the equivalent UK adopted standard in force at the time of the measurements). They will be calibrated in accordance with the procedure specified in BS 4142: 1997 (or the equivalent UK adopted standard in force at the time of the measurements).

3. The microphone will be mounted at 1.2 - 1.5 metres above ground level, fitted with a two-layer windshield or suitable equivalent, and placed outside the residential property. Measurements should be made in “free field” conditions. To achieve this, the microphone should be placed at

least 3.5 metres away from the building facade or any reflecting surface except the ground at the approved measurement location.

4. Measurement of tonal noise from the wind farm will not be carried out unless specifically requested by the Local Planning Authority following a complaint about such noise.

Wind Speed Measurements

5. Any noise compliance measurements made in shall be correlated with 10m-height wind speeds measured on-site, or wind speed measurements carried out at 2 heights such that the 10m height wind speed can be accurately calculated, as required by Condition 23.

6. If the 10m-height wind speed is to be calculated from two heights (e.g. 65m and 25m as detailed at condition 23) rather than measured at 10m-height, then the 10-minute wind shear exponent between the two heights will be used to calculate the 10m-height wind speed.

7. The $L_{A90,10\text{-minute}}$ measurements will be synchronised with measurements of the 10-minute arithmetic mean wind speed logged at the on-site anemometry mast.

Survey Length

8. Noise monitoring equipment will be installed for an initial period of 2 weeks to monitor levels of noise with the turbines operating normally. The measured on-site wind speed and direction will be monitored during the survey to ensure that sufficient data is captured, and it will be ensured that there are at least 5, 10-minute data points, in each 10m-height wind speed bin from 3-12 m/s for each property for downwind propagation as defined at paragraph 9.

Data Analysis

9. The measured noise data will be filtered to include only that for down-wind propagation from the site towards the monitoring location unless otherwise agreed with the Local Planning Authority. Downwind propagation will be taken to mean excluding data corresponding to any wind direction which is more than 45 degrees from every line from each of the turbines and the measurement position. Any data corresponding to periods of rainfall will also be excluded together with periods when turbine operation was not deemed to be normal as evidenced by rotational speed, power generation and wind speed data logged by the turbines.

10. The noise data for each interval period will then be plotted against the equivalent 10 metre height wind speed, derived as described in Paragraphs 5 and 6 (above). A best fit curve will be plotted through the data points to provide the measured noise level at integer wind speeds over the wind speed range for which data is available which can be compared with the noise limits specified in Planning Condition 20.

11. If the results from the analysis described at Paragraph 10 show that the noise level is above the limit, further measurements will be carried out to include turbine shut down periods, to correct for the influence of background noise, with the background noise subtracted from the measured noise using the formula on page 103 of ETSU-R-97 *The Assessment and Rating of Noise from Wind Farms*.

12. A report on the results of the measurements will be supplied to the Local Planning Authority within 4 months of the completion of the measurements as required by condition 20.

Appendix B

Tonal Noise Assessment Protocol

FULLABROOK WIND FARM

TONAL NOISE ASSESSMENT PROTOCOL

Rob Shepherd, Hayes McKenzie Partnership Ltd

26th July 2012

HM: 2467_1_RES

1. - Introduction

1.1. - This document has been prepared by Hayes McKenzie Partnership Ltd. (HMP) to facilitate agreement between HMP and North Devon Council with regard to the analysis of tonal noise at the Fullabrook Wind Farm.

1.2. - Initial investigation of the audio recordings at Binalong, Crackaway, and Beara has proved inconclusive due to the large number of audio recordings that are affected by tonal noise not associated with the operation of the wind farm. Initially data was selected for each measurement location for a large number of periods where each measurement location was downwind of the turbines during the night hours divided into periods where the turbines were operational and periods where the turbines were shut down. Tonal noise was identified in the narrow band spectra during both periods. Due to the large amount of audio data analysed it was not possible to listen to each sample to ensure that each sample analysed was free from non-turbine noise.

1.3. - This document provides a proposed assessment methodology that reduces the number of samples to be analysed and maximises the likelihood of obtaining audio samples for analysis that are not affected by non-turbine noise, whist ensuing that the analysis is carried out in line with the noise conditions for the site.

2. - Methodology

2.1. - For each integer wind speed bin from 3-11 m/s (as measured at 10m height) the 10 nearest periods (with wind speeds closest to each integer wind speed) for which 'clean' audio data is available will be analysed for tones.

2.2. - Only audio data recorded between 2300-0400 hours will be analysed to minimise the likelihood of the data being contaminated by non-turbine noise (such as rainfall, cars, trucks, and animals). Clean audio will be classed as samples not corrupted by non-turbine noise

determined though listening to the audio and analysis of spectrograms of each sample. It should be noted that for some wind speed bins it may not be possible to obtain 10 audio samples.

2.3. - The tone level above audibility will be plotted against wind speed, and an average tone level will be calculated though the data as required by ETSU-R-97.

2.4. - The required tonal penalty for each integer wind speed will be determined through this process and calculated according to the graph on page 104 of ETSU-R-97 (as referred to in the noise conditions), and the required tonal penalty will be added to the measured noise levels at each property.

Appendix C

Noise Compliance Assessment Charts

Figure 1 Binalong Noise Compliance Assessment Chart 1

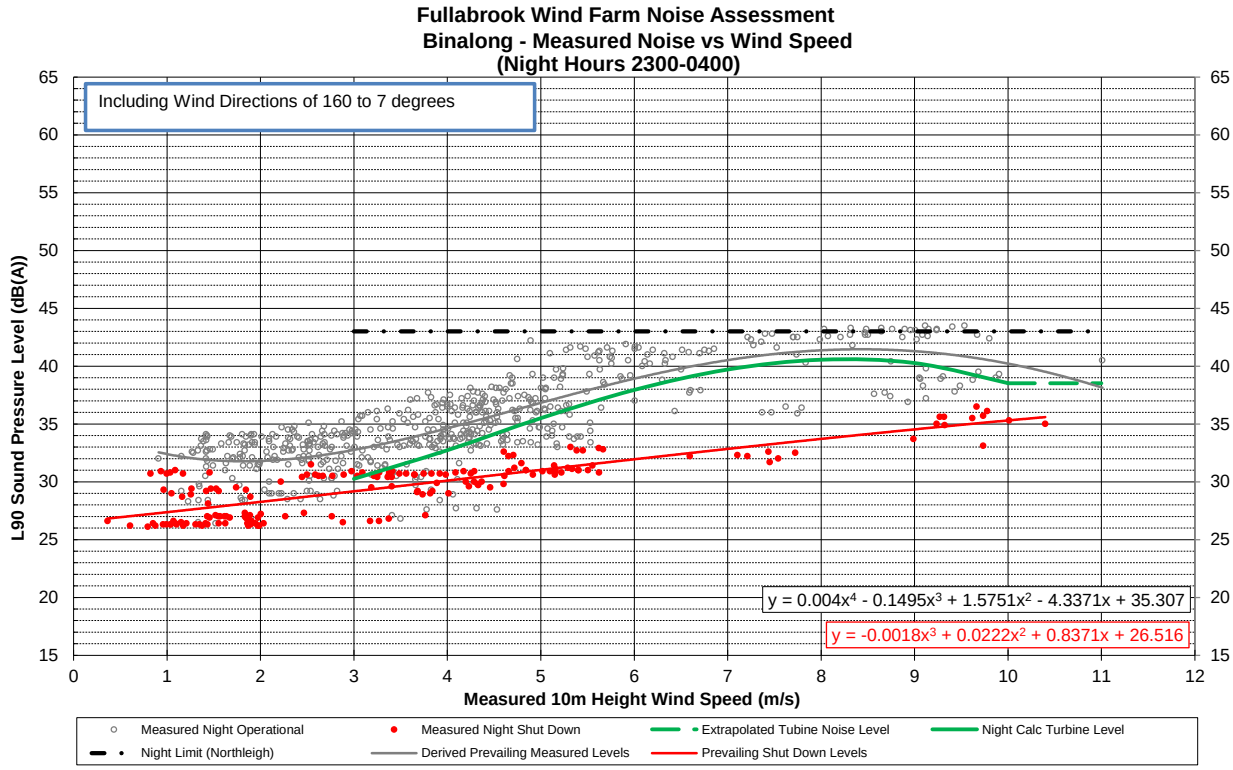


Figure 2 Binalong Noise Compliance Assessment Chart 2

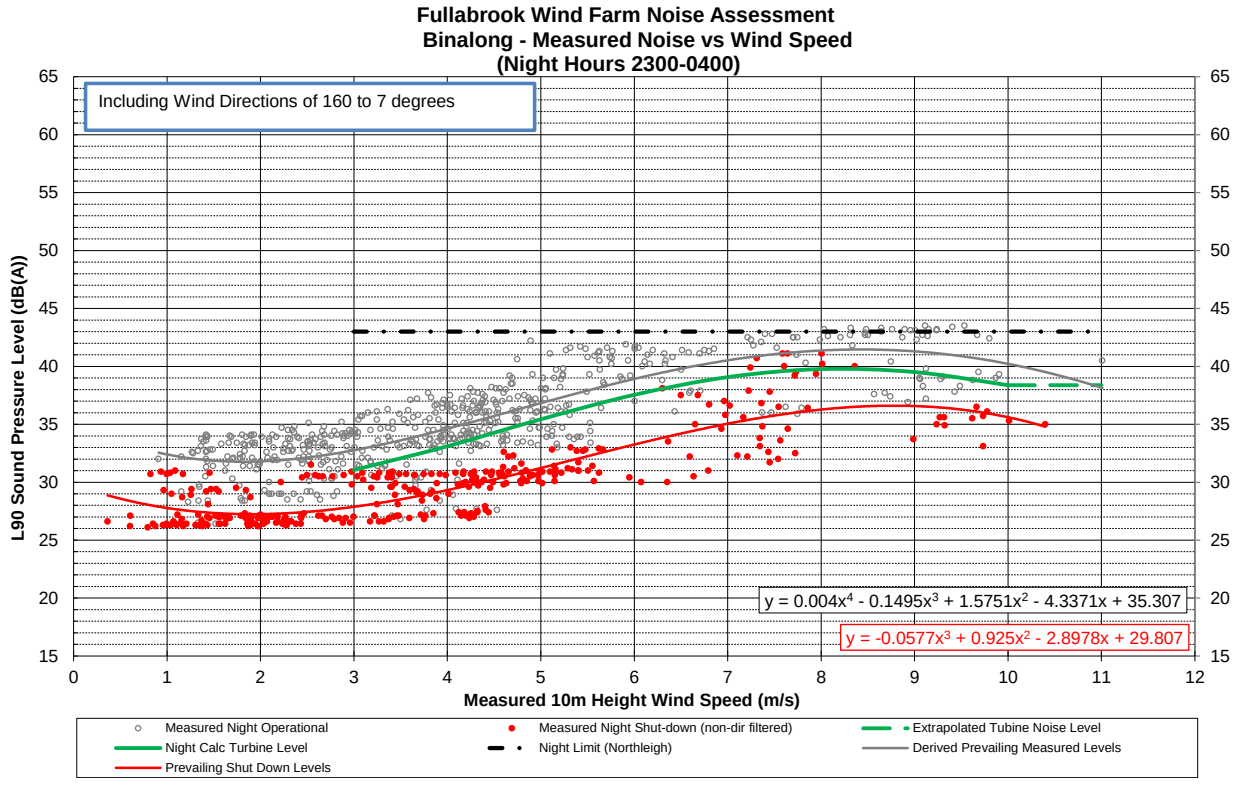


Figure 3 Binalong Noise Compliance Assessment Chart 3

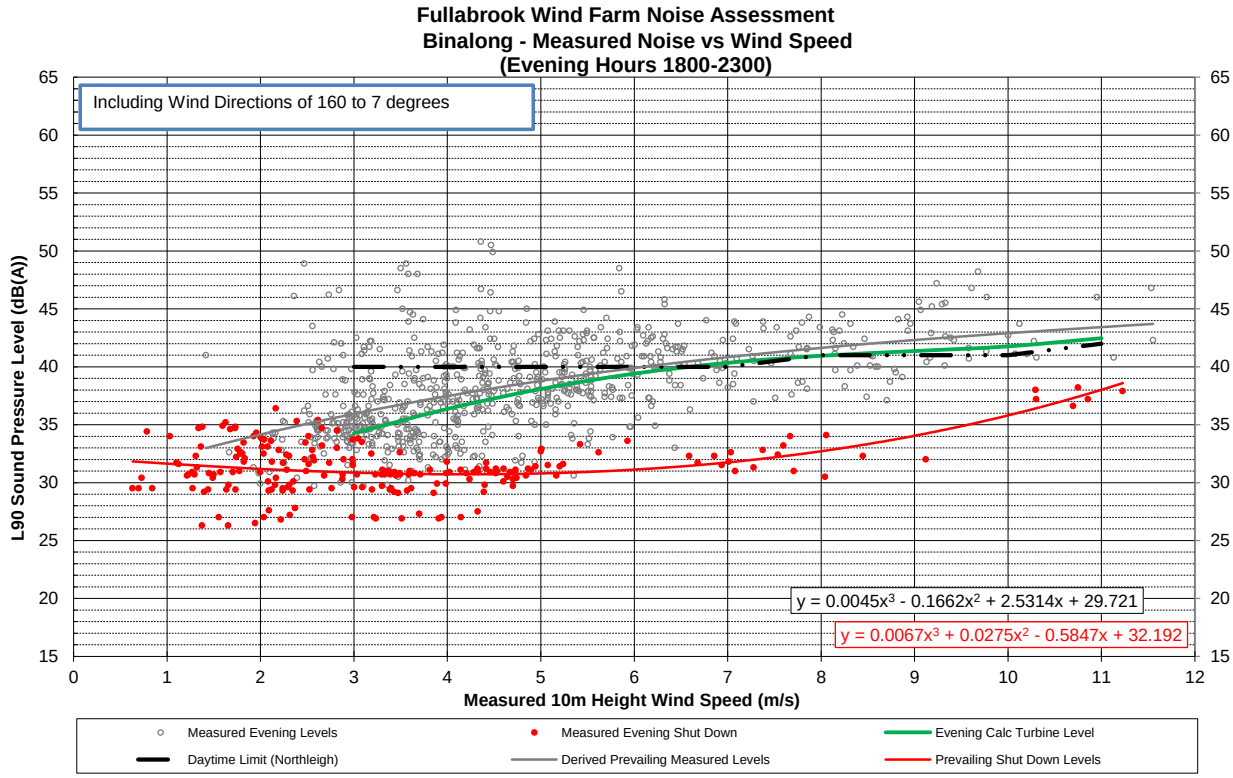


Figure 4 Binalong Noise Compliance Assessment Chart 4

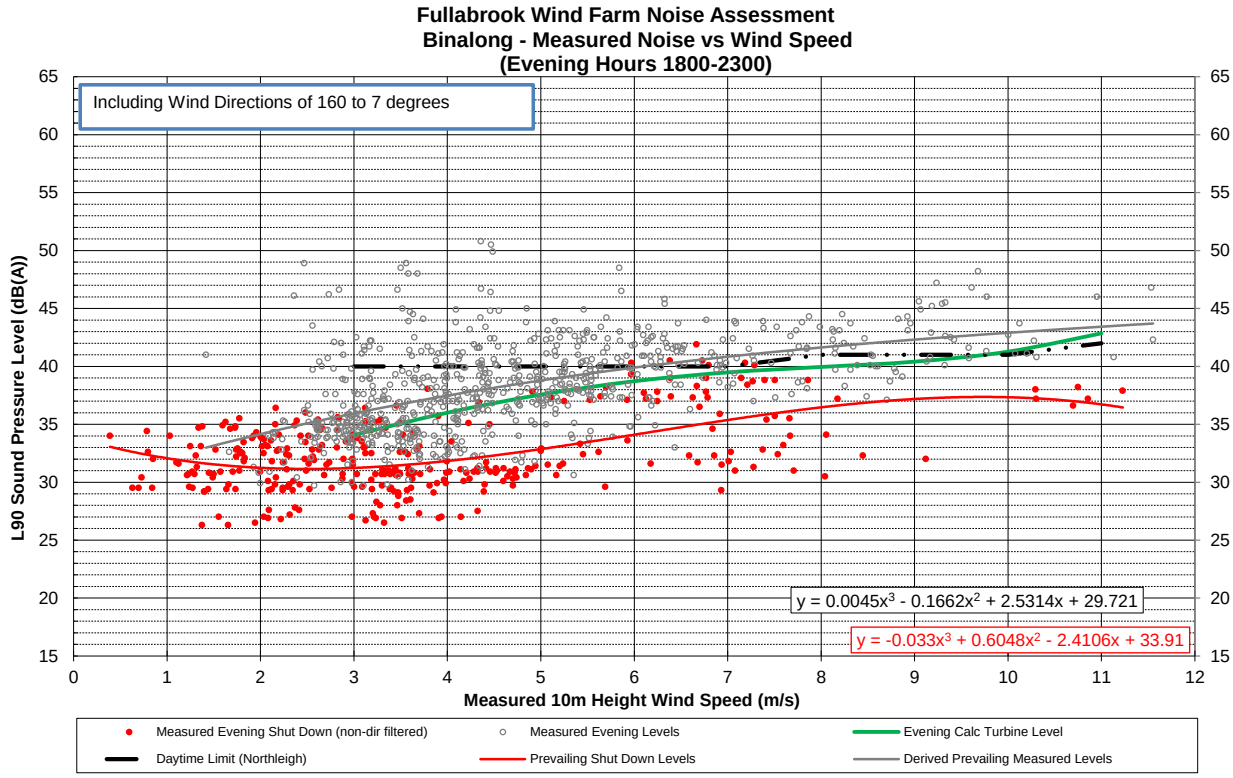


Figure 5 Binalong Noise Compliance Assessment Chart 5

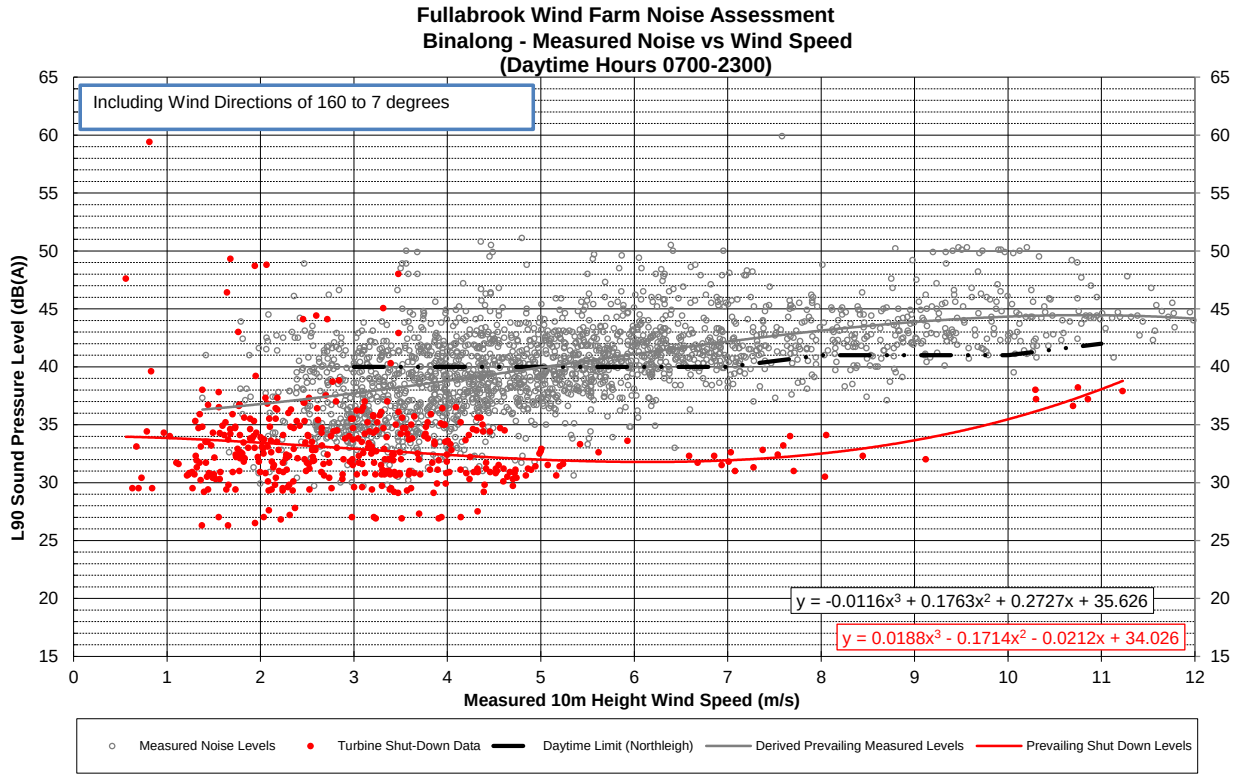
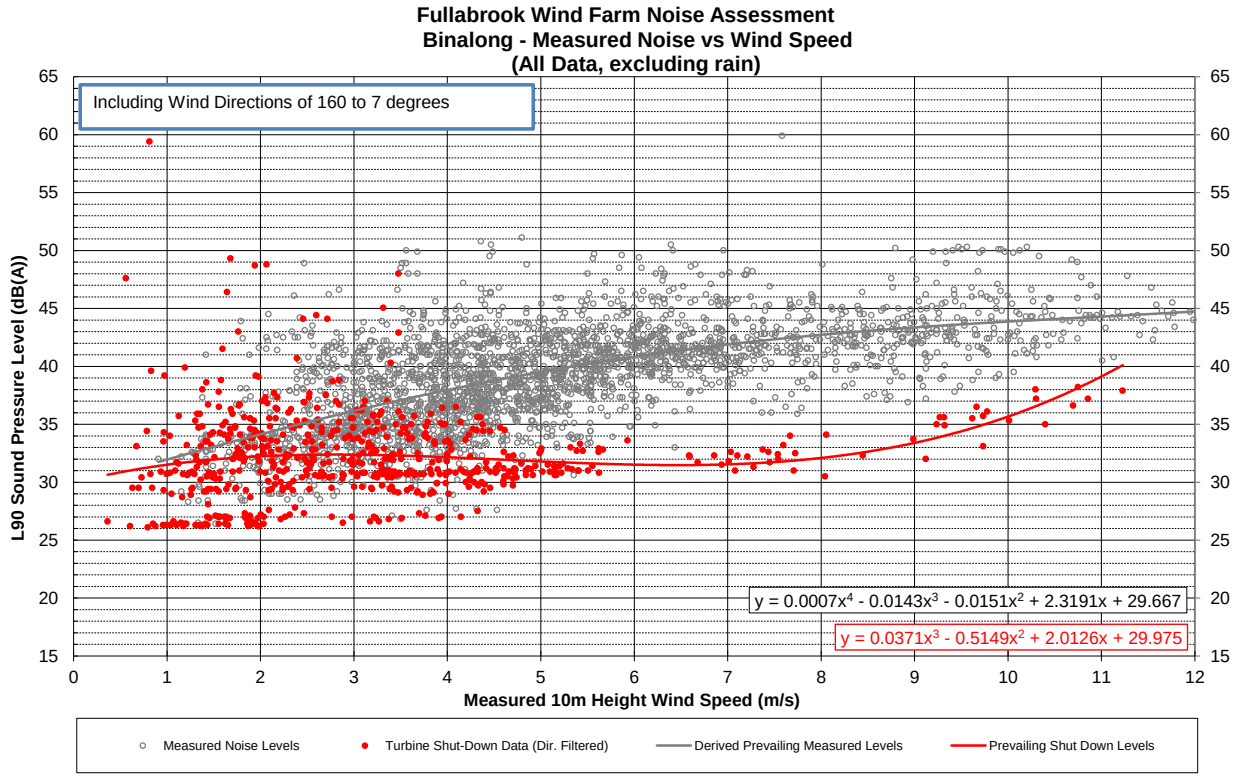


Figure 6 Binalong Noise Compliance Assessment Chart 6



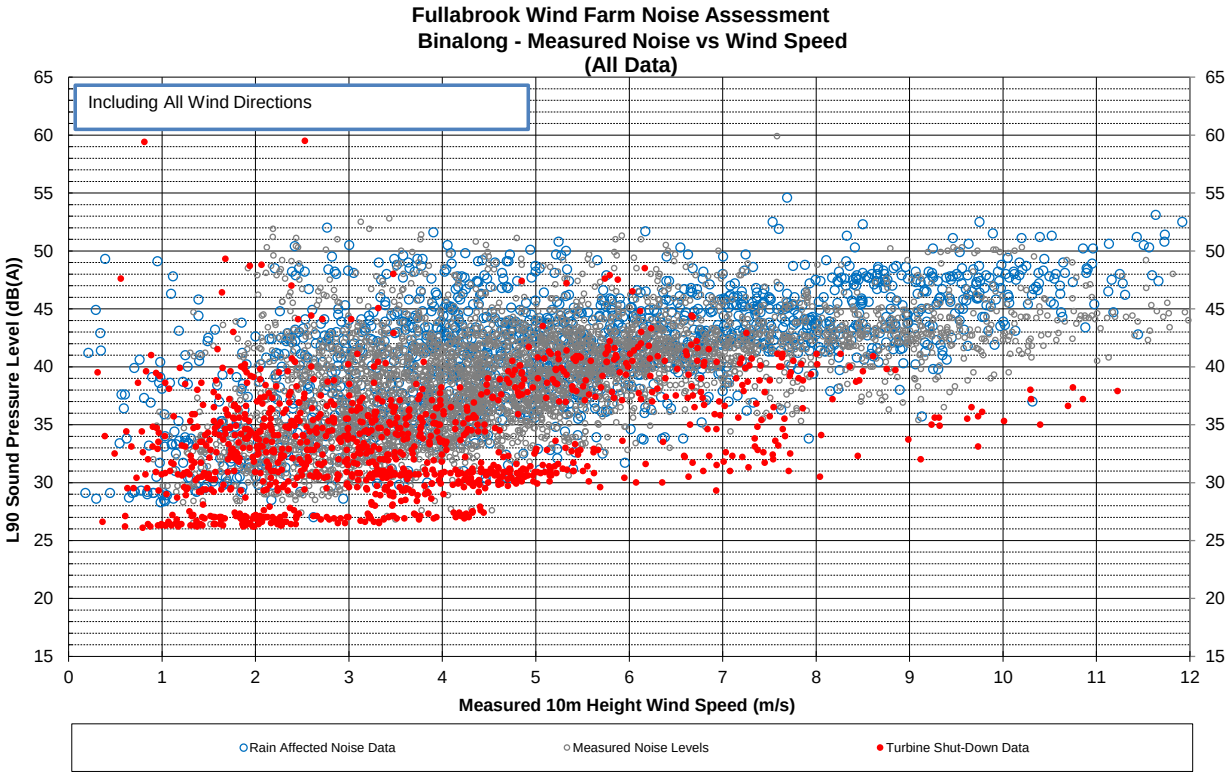

Fullabrook Wind Farm Noise Assessment
Binalong - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 8 Crackaway Noise Compliance Assessment Chart 1

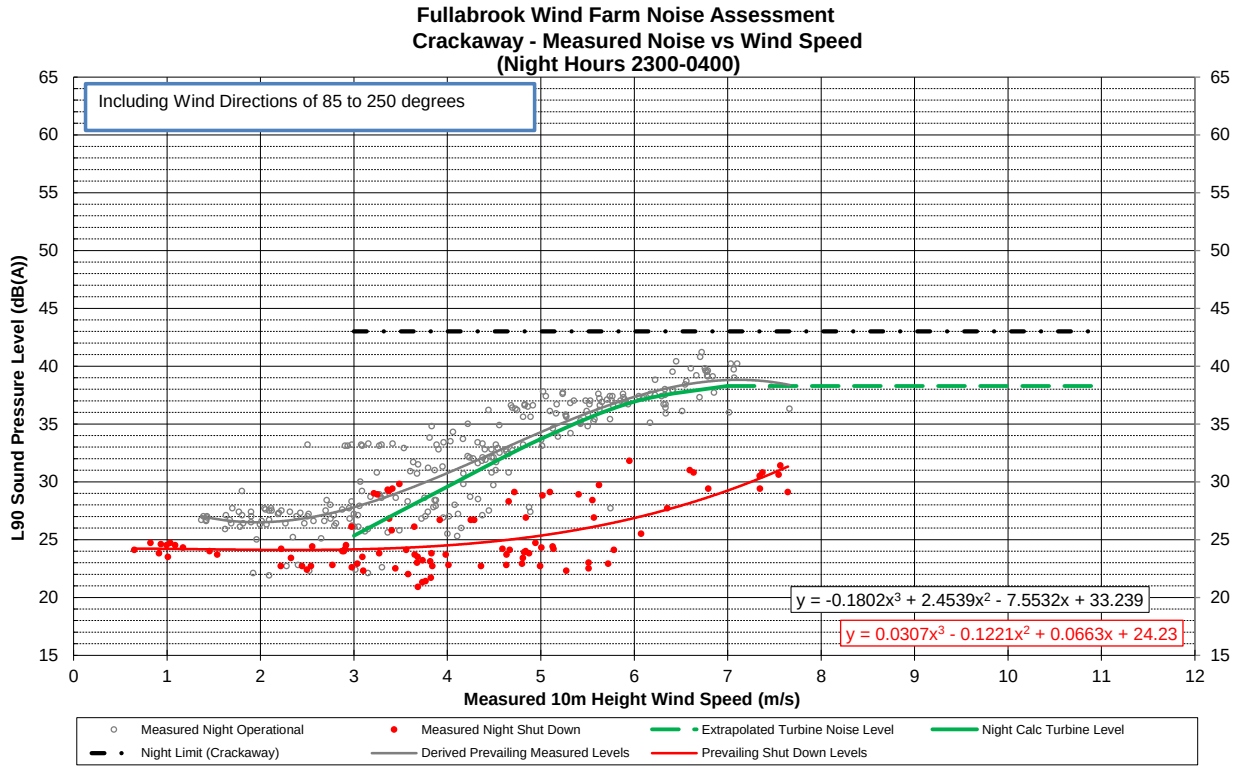


Figure 9 Crackaway Noise Compliance Assessment Chart 2

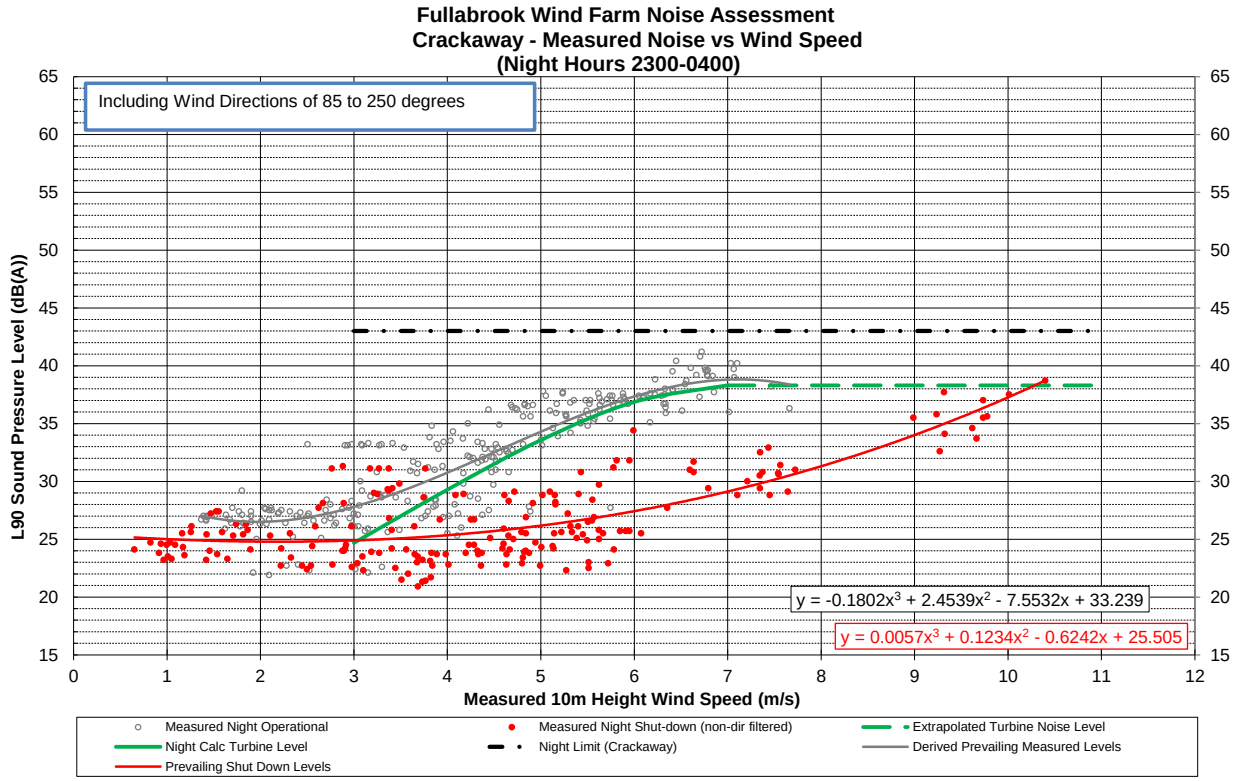


Figure 10 Crackaway Noise Compliance Assessment Chart 3

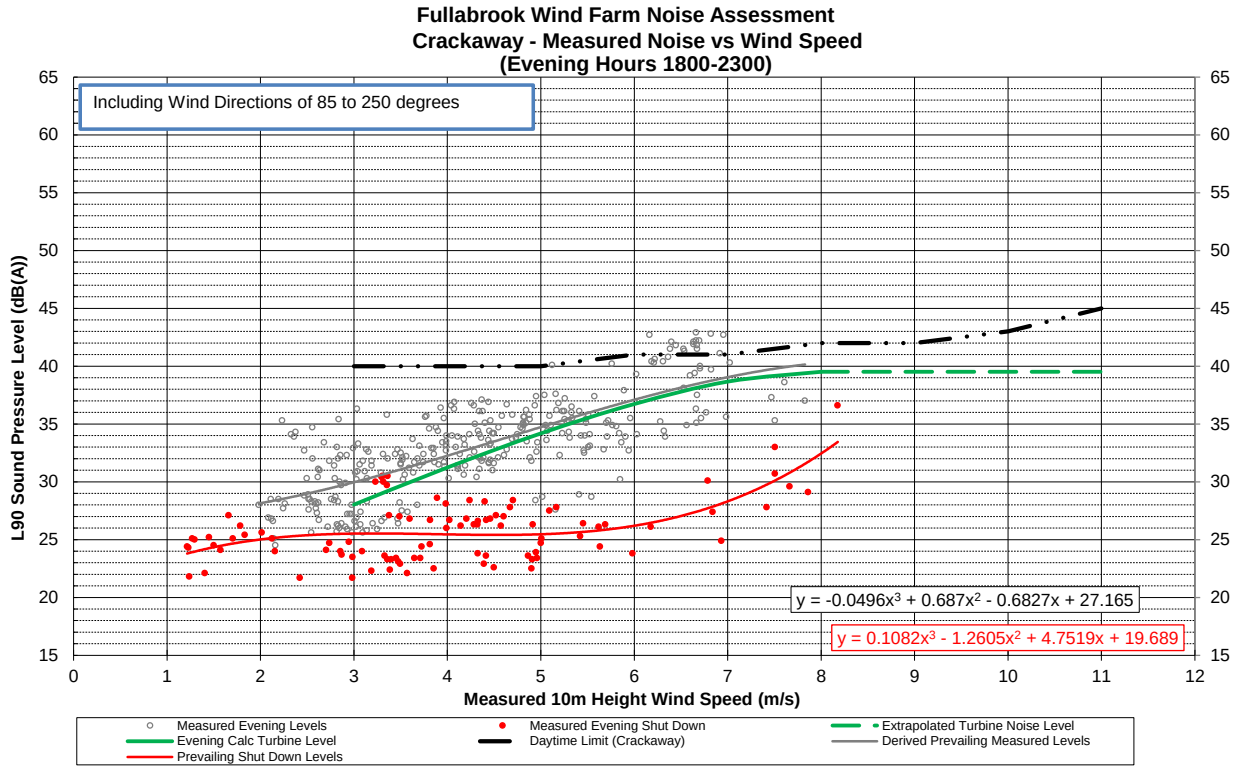


Figure 11 Crackaway Noise Compliance Assessment Chart 4

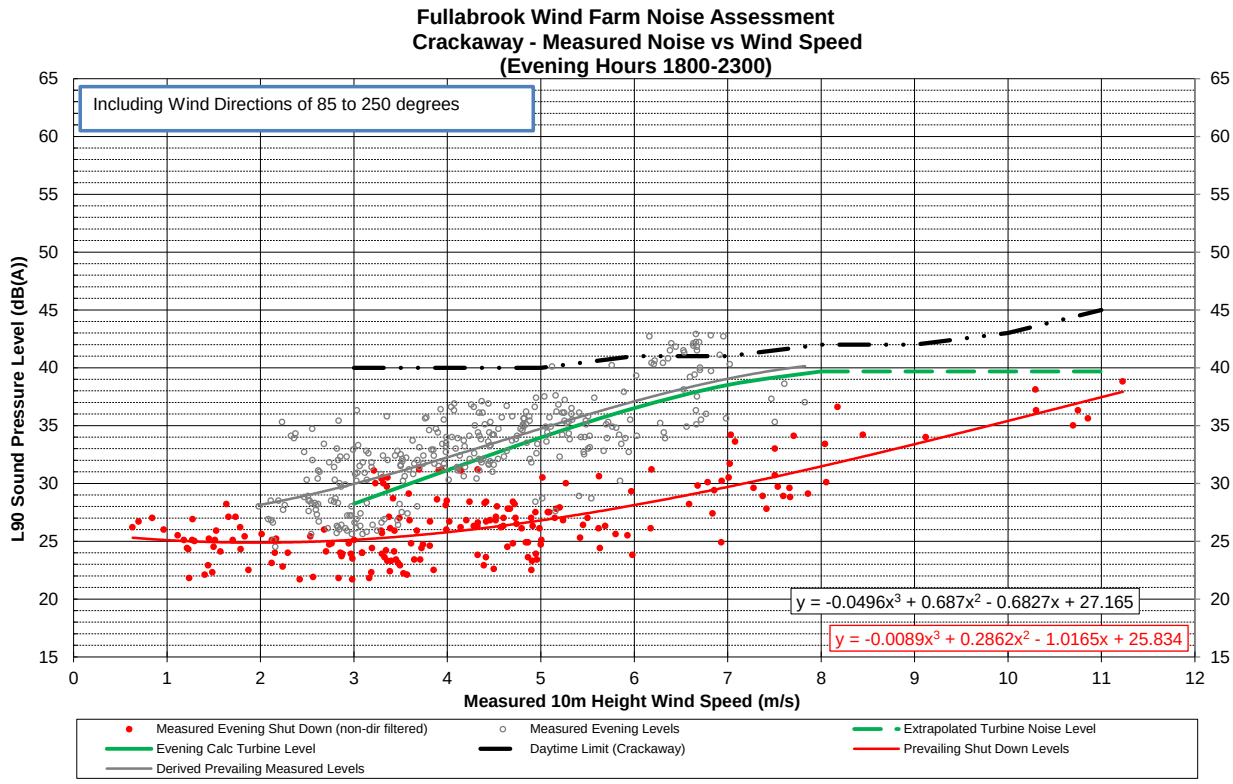


Figure 12 Crackaway Noise Compliance Assessment Chart 5

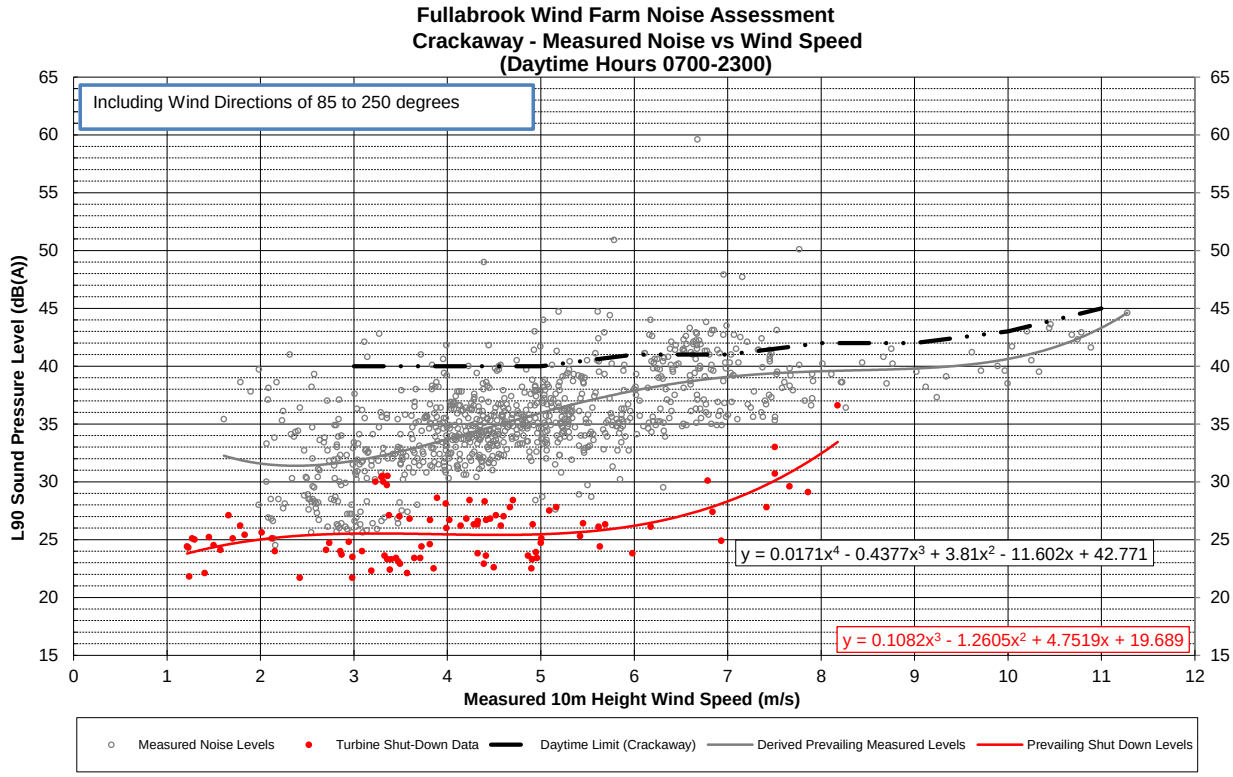


Figure 13 Crackaway Noise Compliance Assessment Chart 6

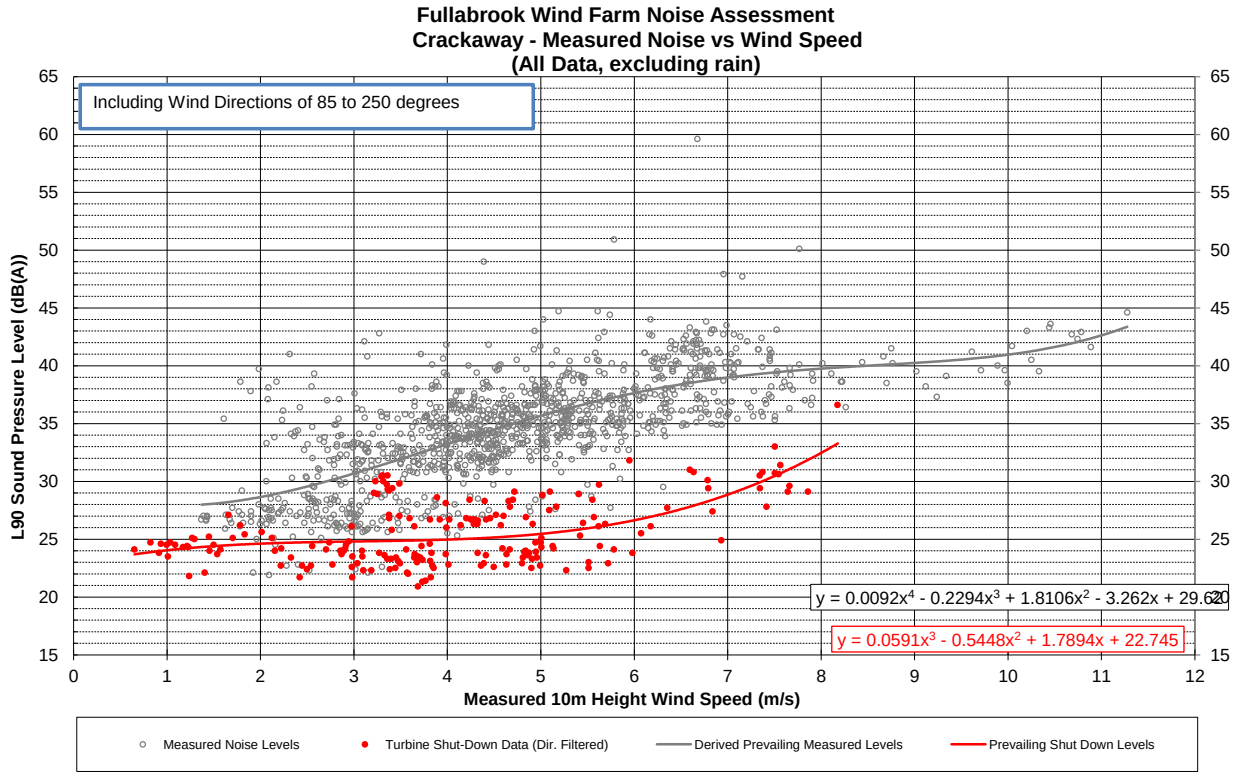


Figure 14 Crackaway Noise Compliance Assessment Chart 7

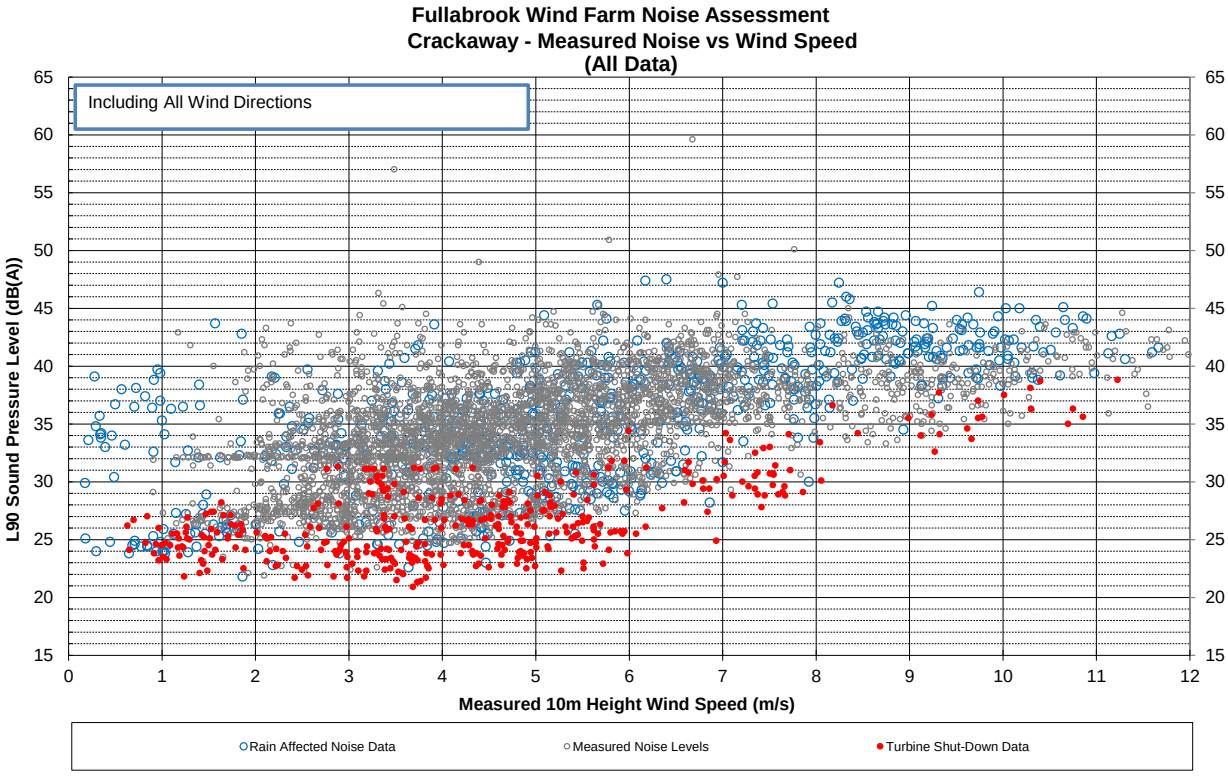


Figure 15 Burland Farm Noise Compliance Assessment Chart 1

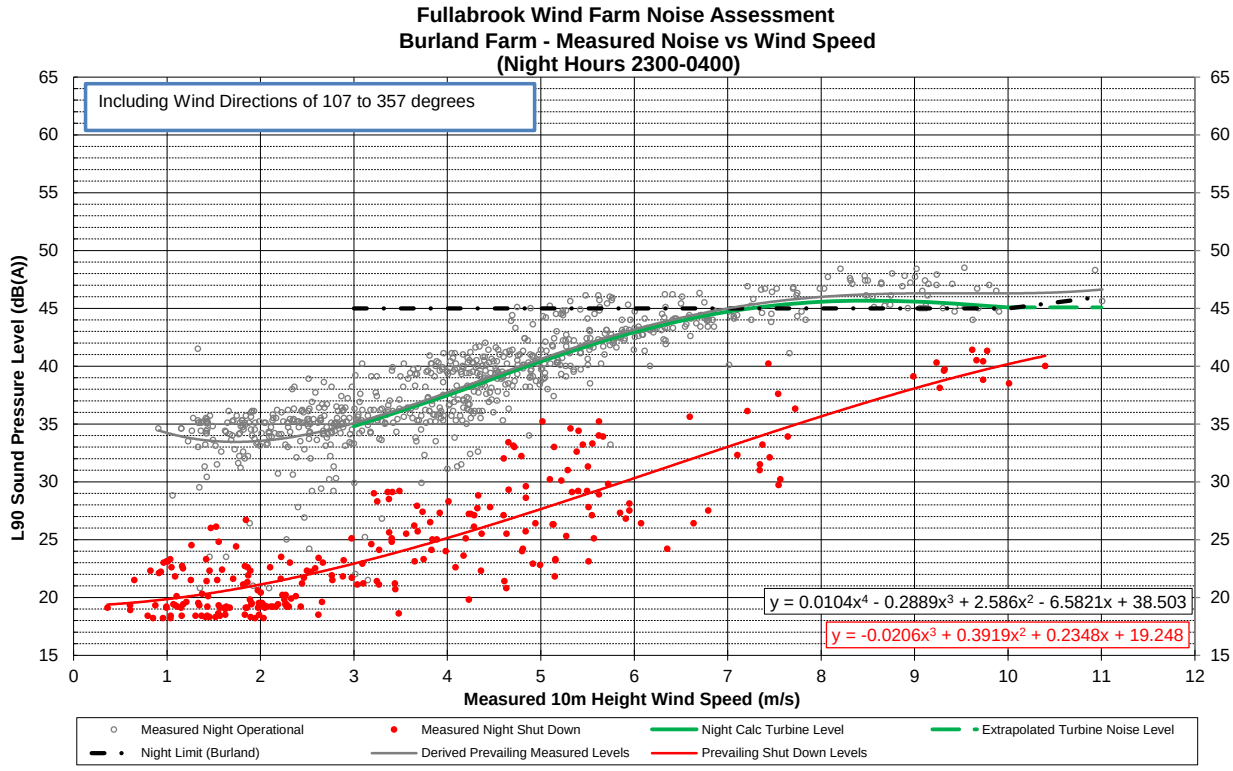


Figure 16 Burland Farm Noise Compliance Assessment Chart 2

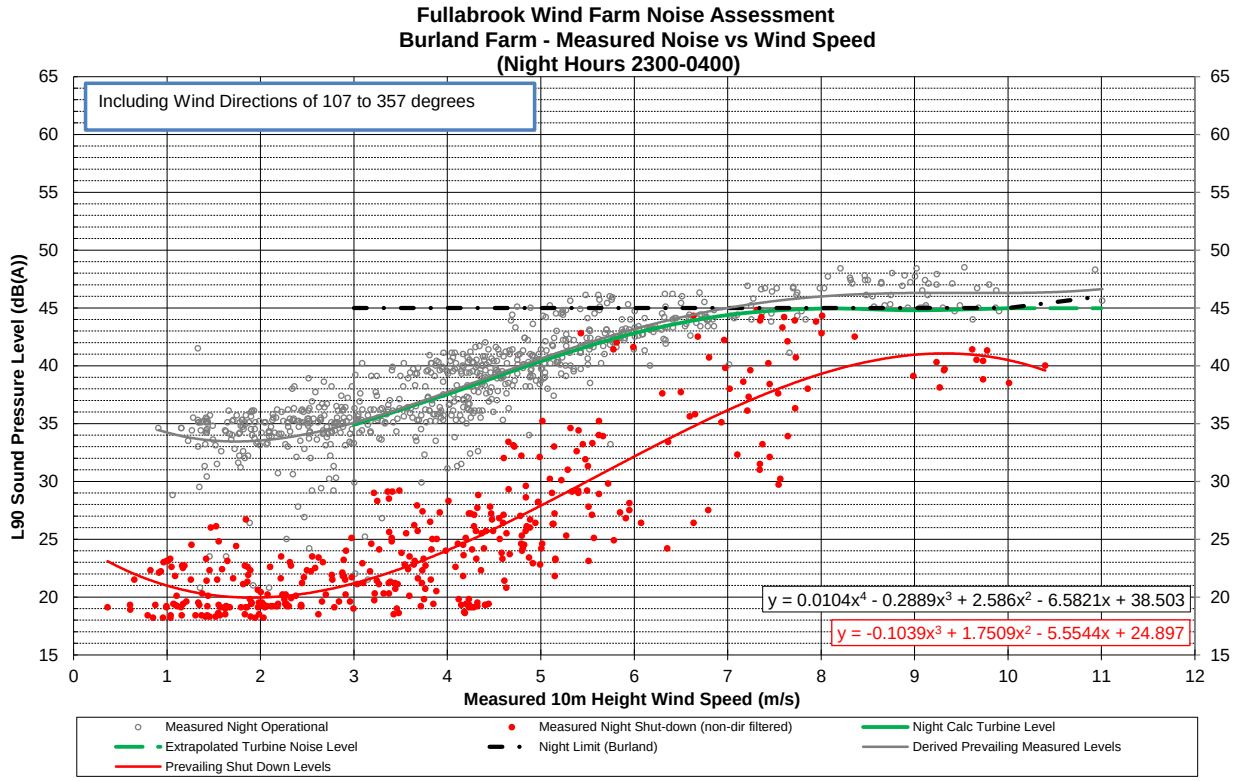


Figure 17 Burland Farm Noise Compliance Assessment Chart 3

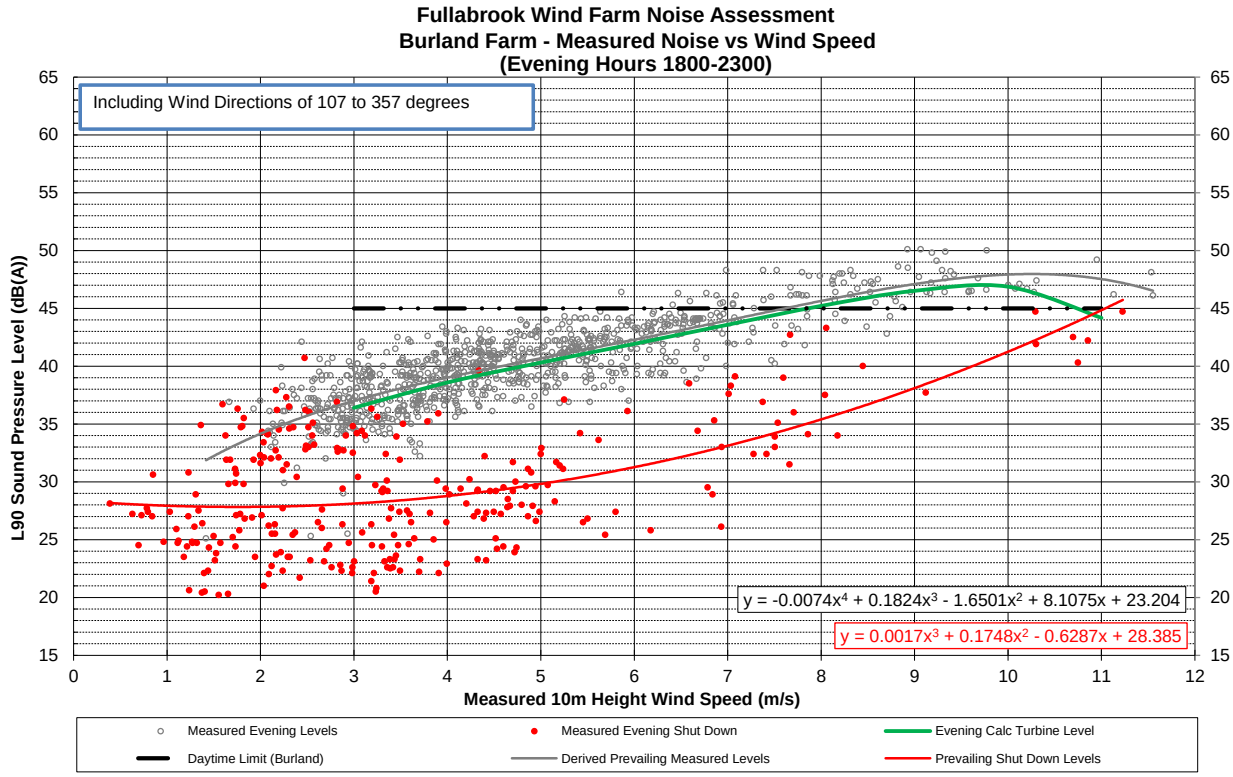


Figure 18 Burland Farm Noise Compliance Assessment Chart 4

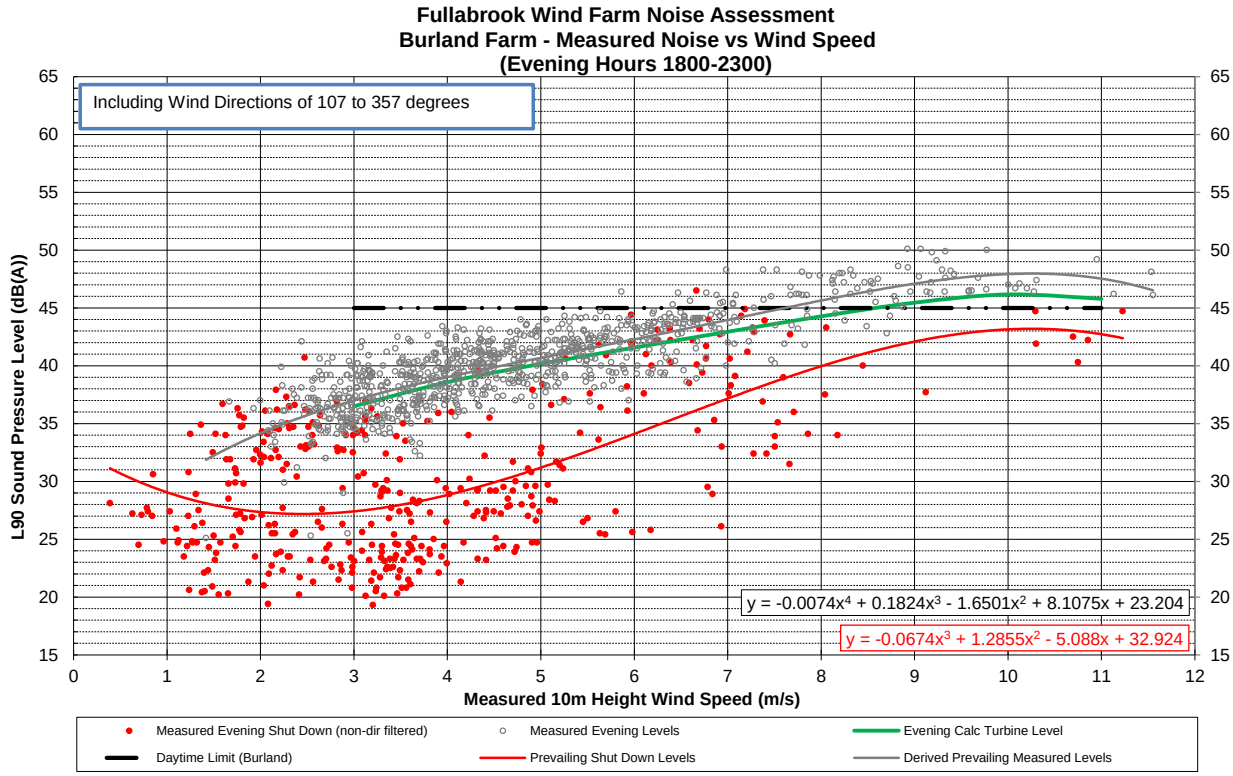


Figure 19 Burland Farm Noise Compliance Assessment Chart 5

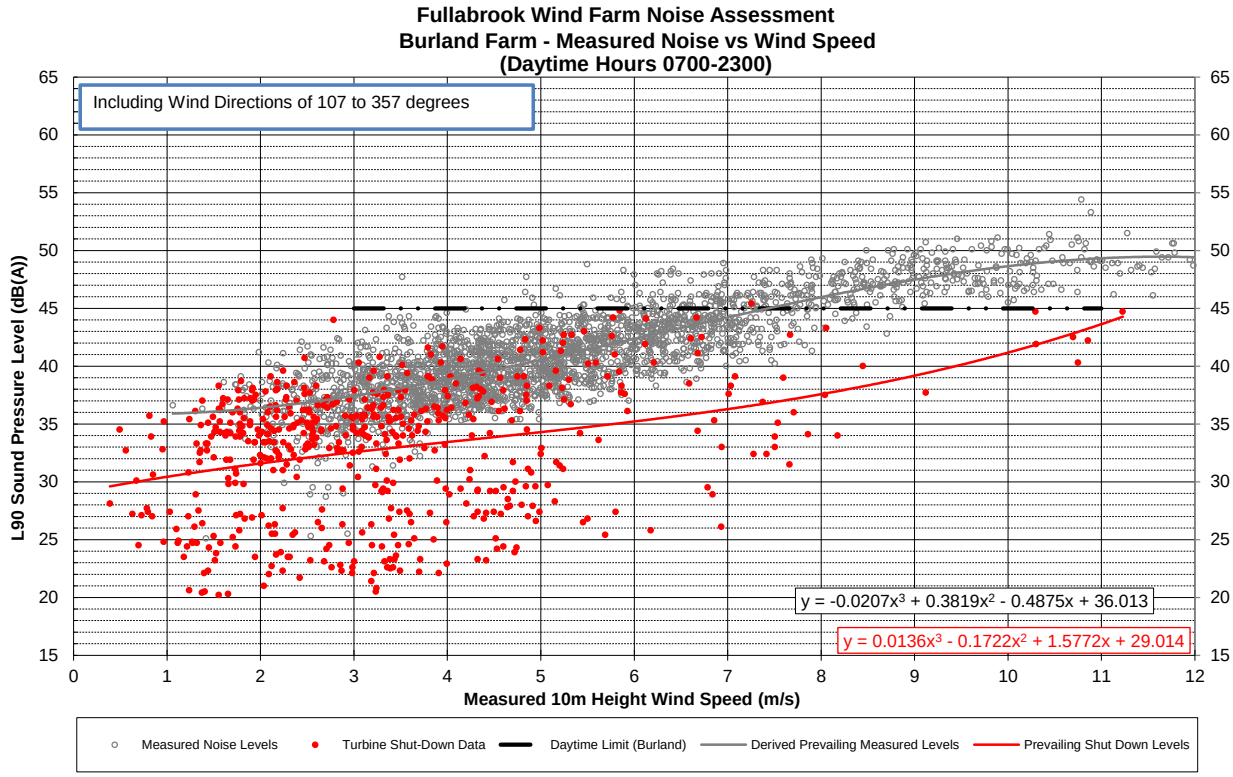
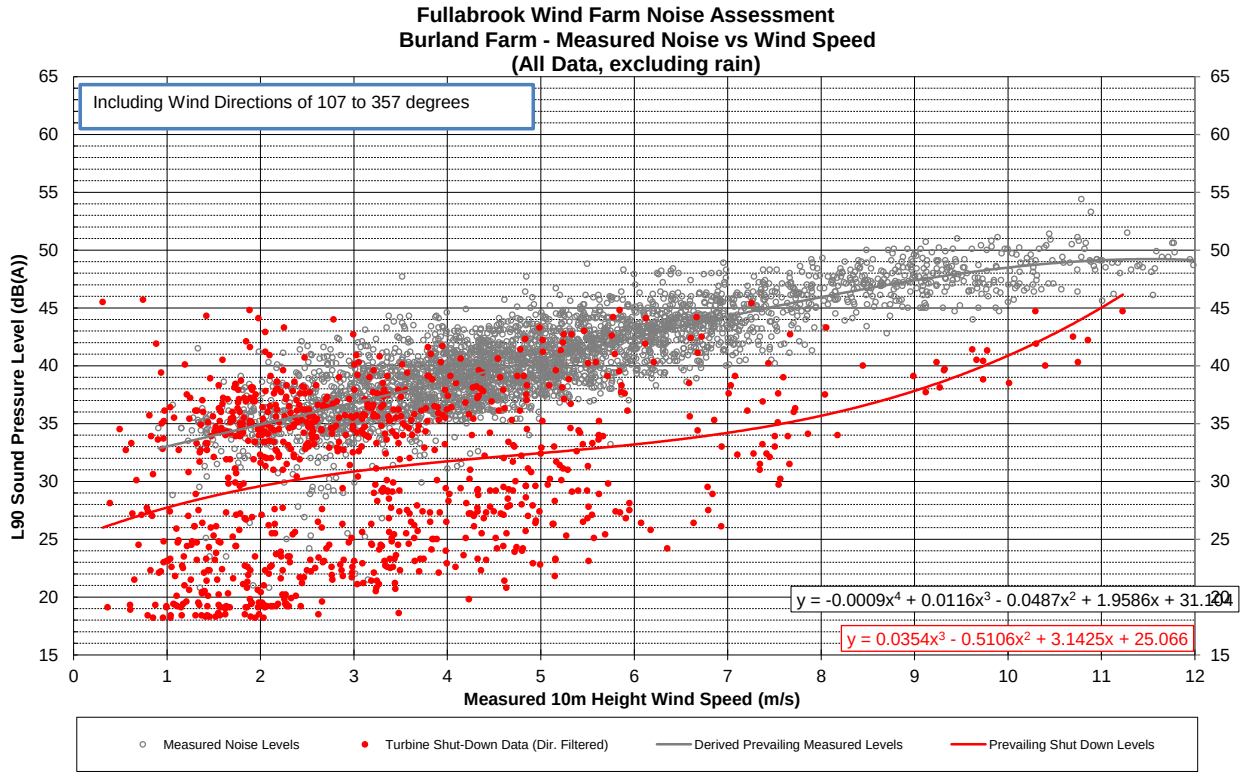


Figure 20 Burland Farm Noise Compliance Assessment Chart 6



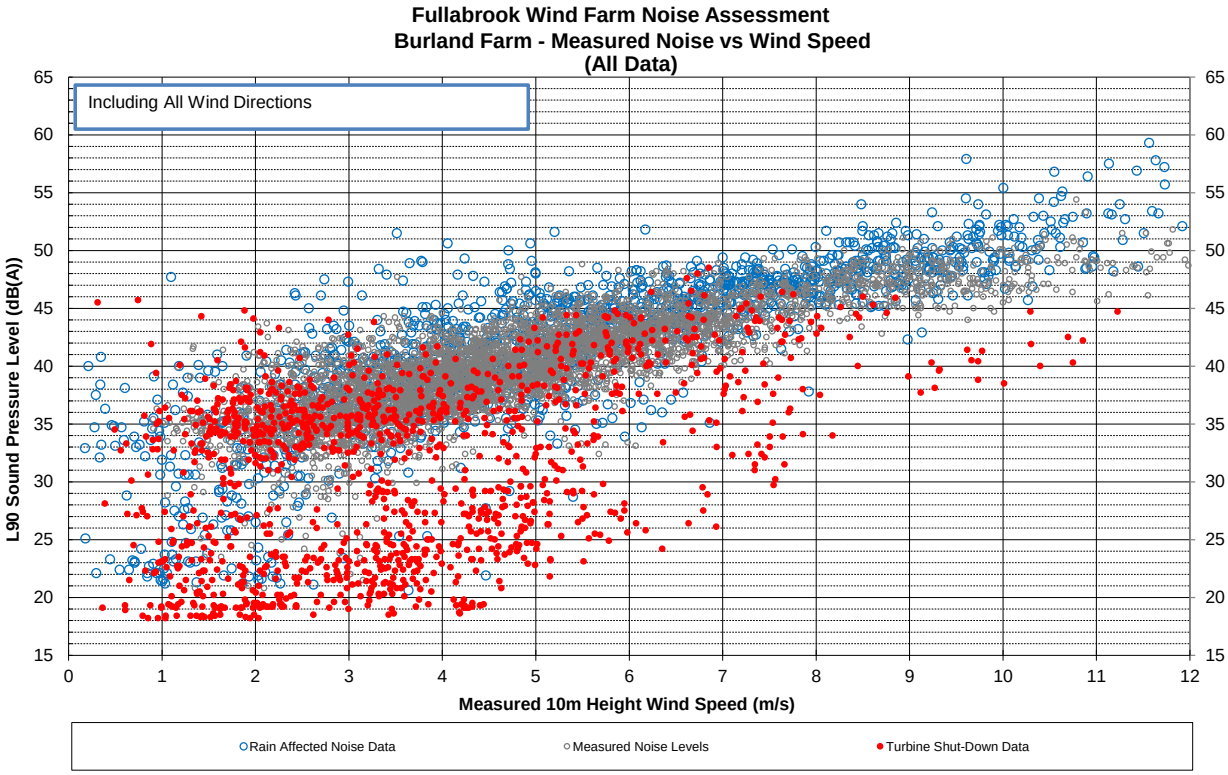

Fullabrook Wind Farm Noise Assessment
Burland Farm - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 22 Metcombe Noise Compliance Assessment Chart 1

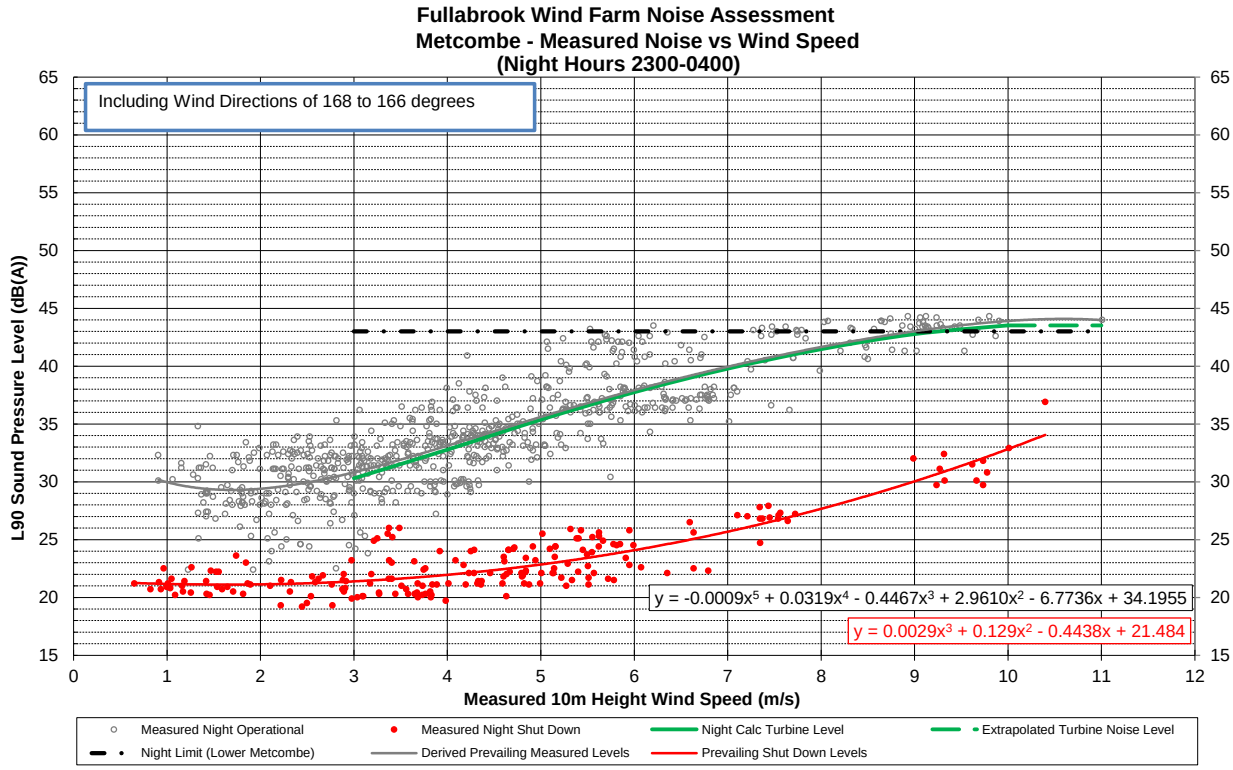


Figure 23 Metcombe Noise Compliance Assessment Chart 2

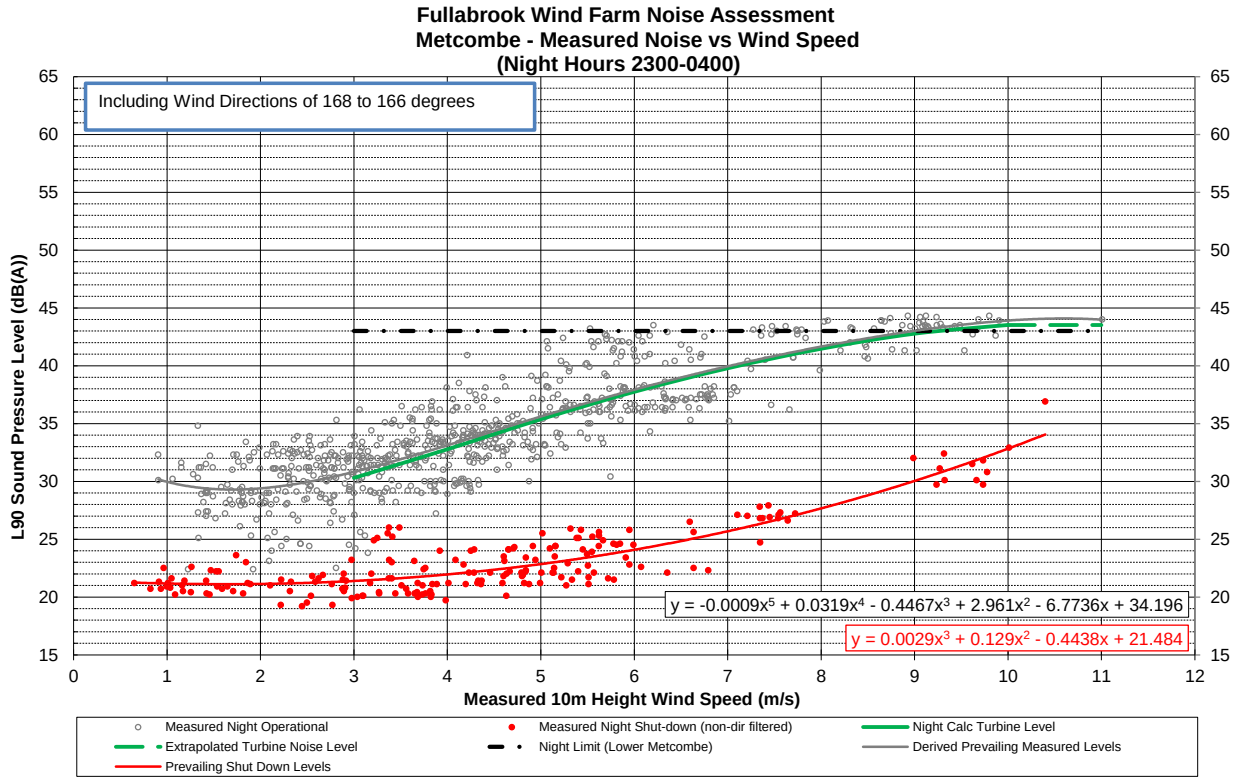


Figure 24 Metcombe Noise Compliance Assessment Chart 3

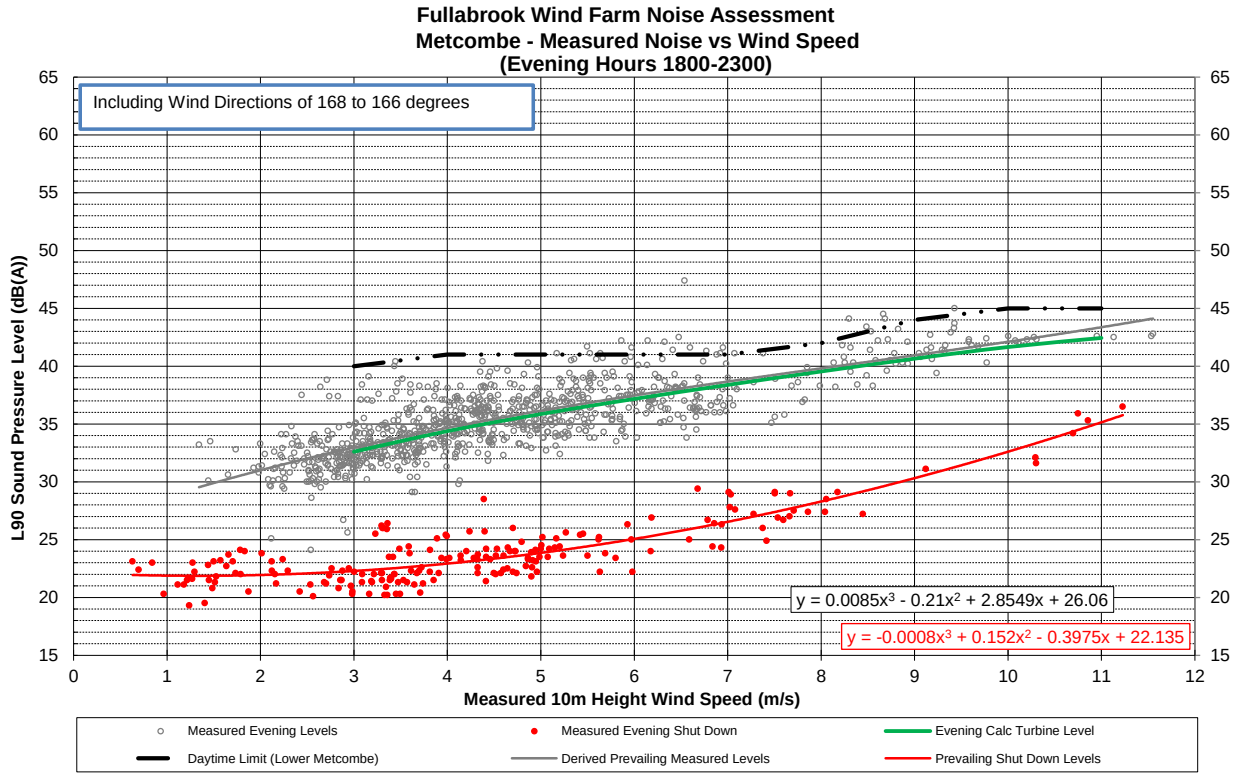


Figure 25 Metcombe Noise Compliance Assessment Chart 4

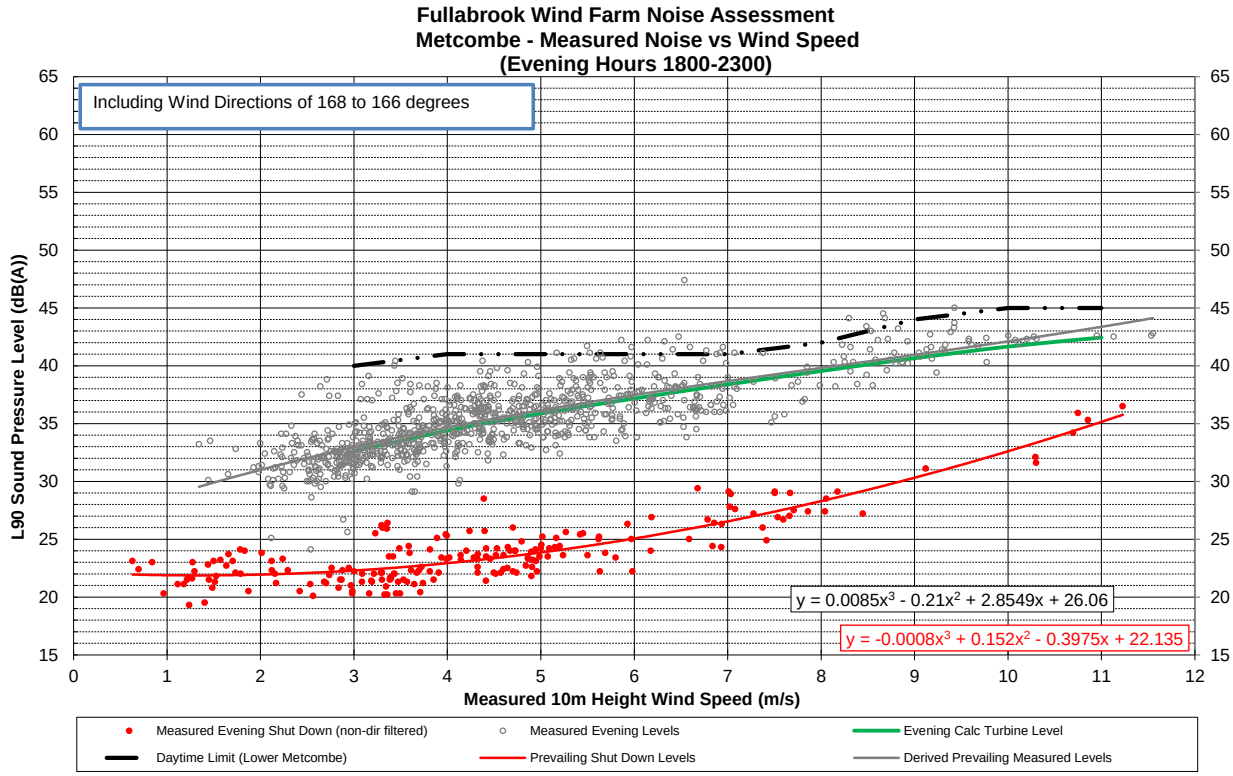


Figure 26 Metcombe Noise Compliance Assessment Chart 5

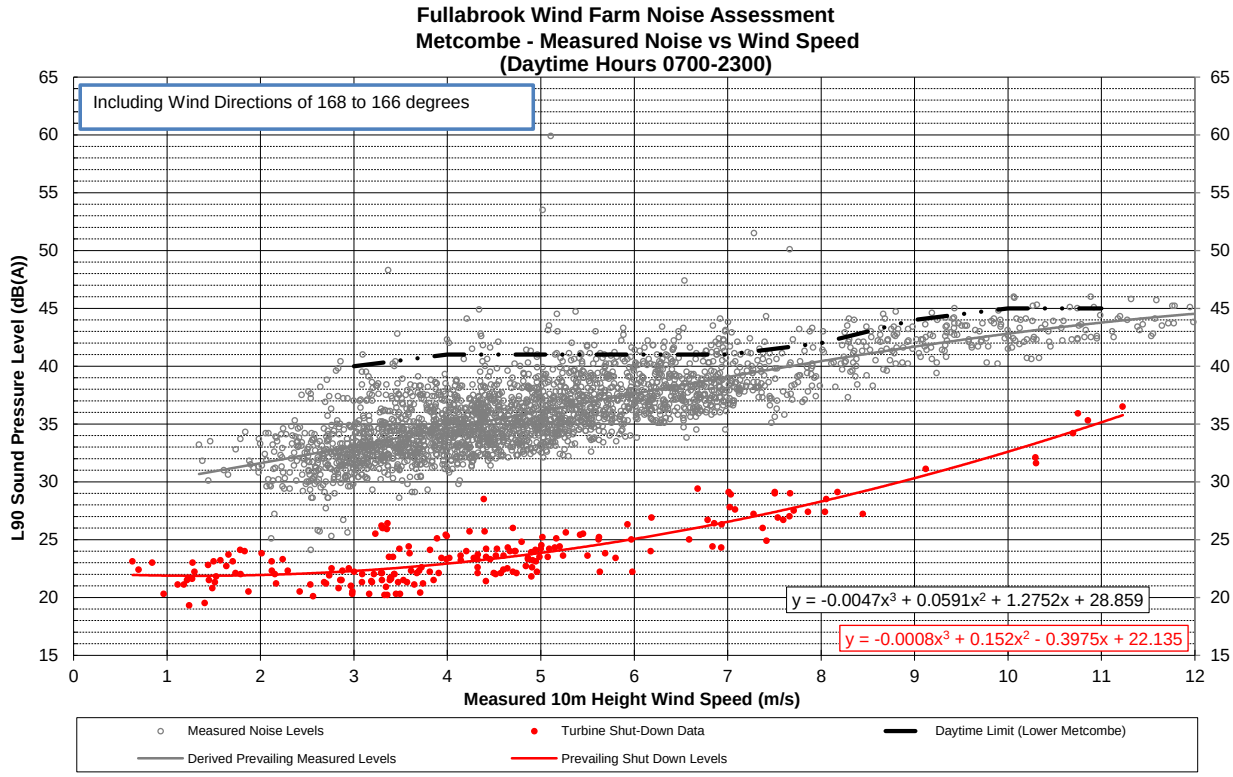


Figure 27 Metcombe Noise Compliance Assessment Chart 6

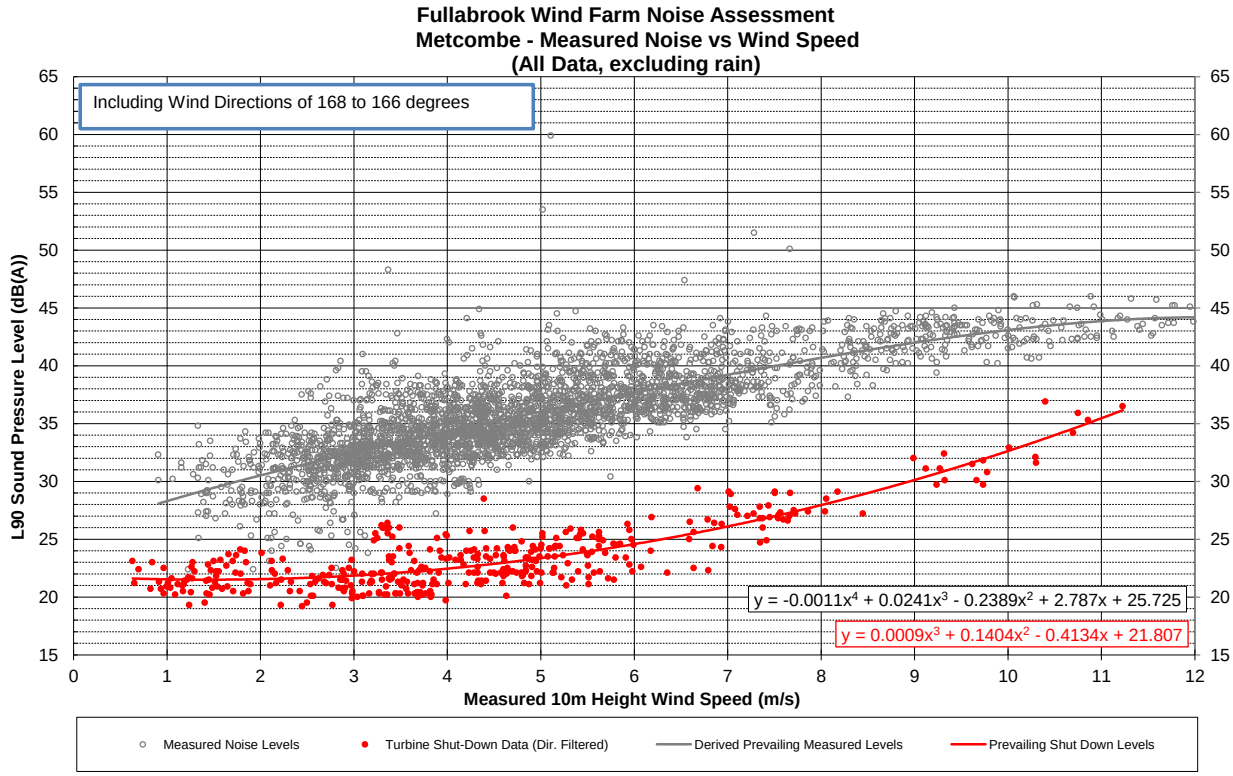


Figure 28 Metcombe Noise Compliance Assessment Chart 7

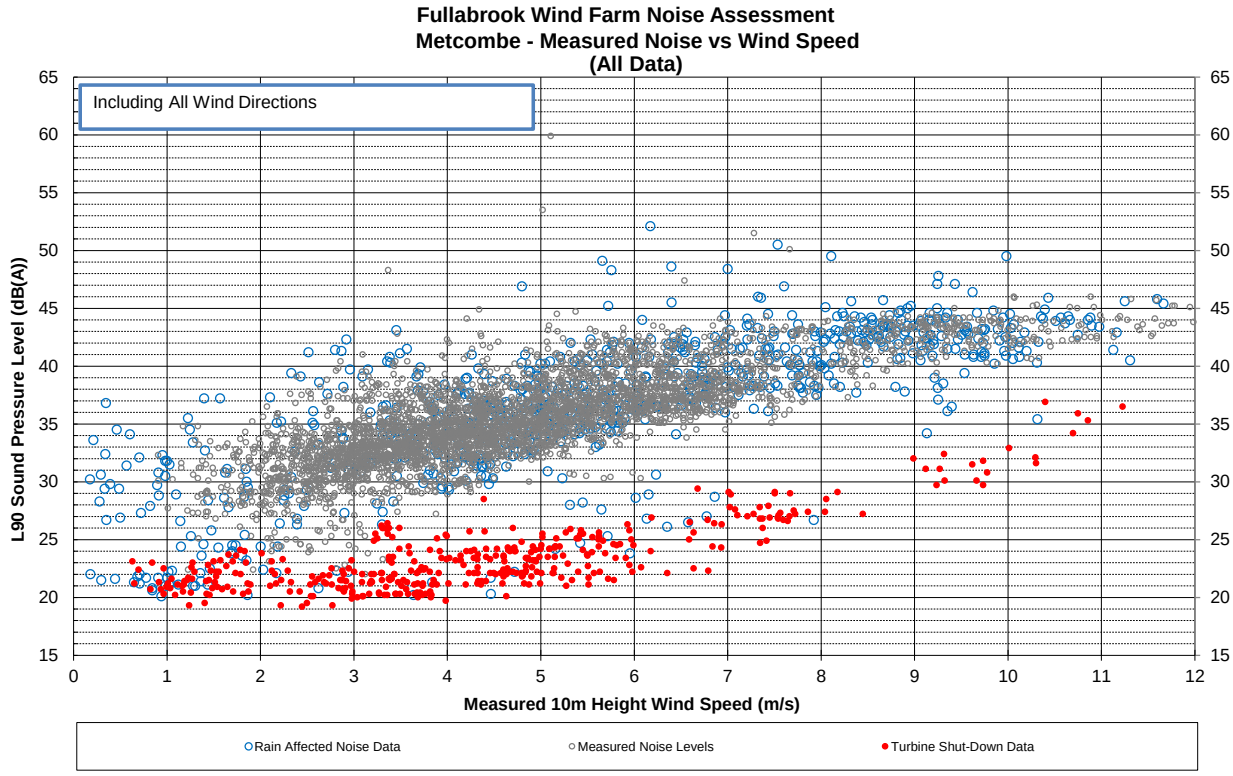


Figure 29 Northleigh Noise Compliance Assessment Chart 1

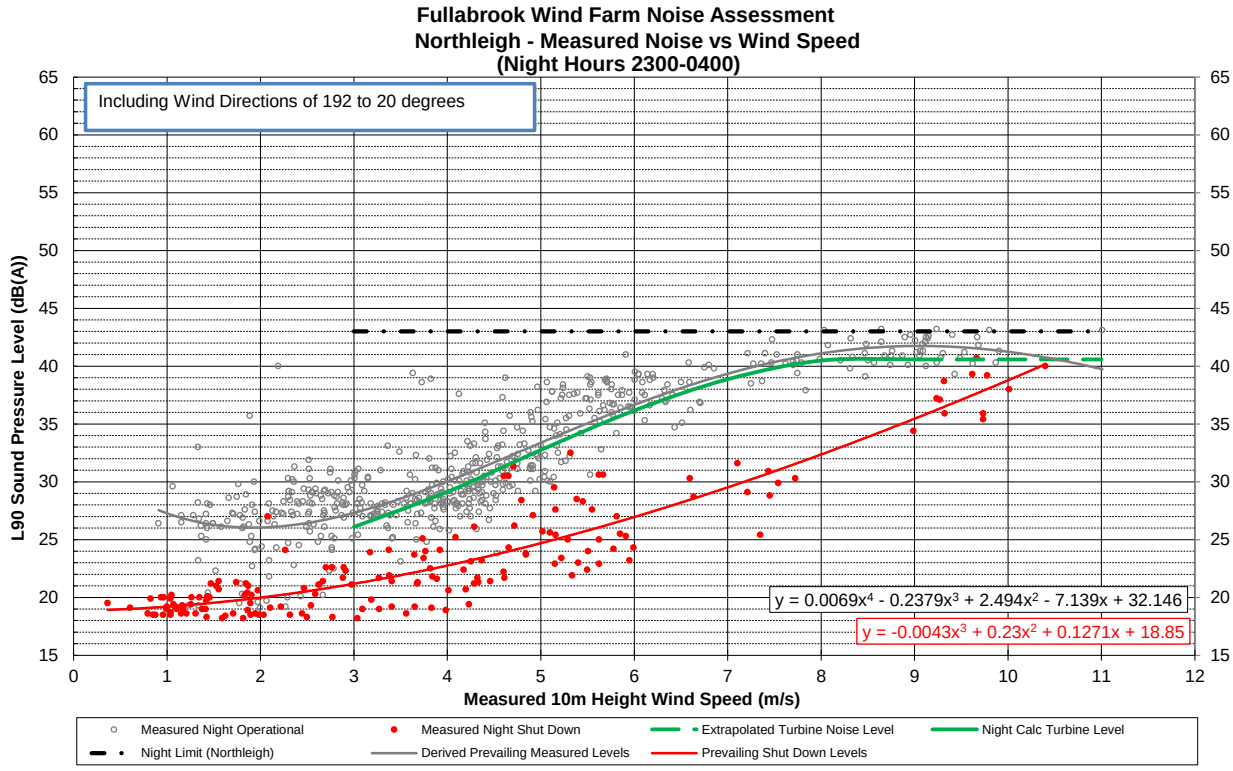


Figure 30 Northleigh Noise Compliance Assessment Chart 2

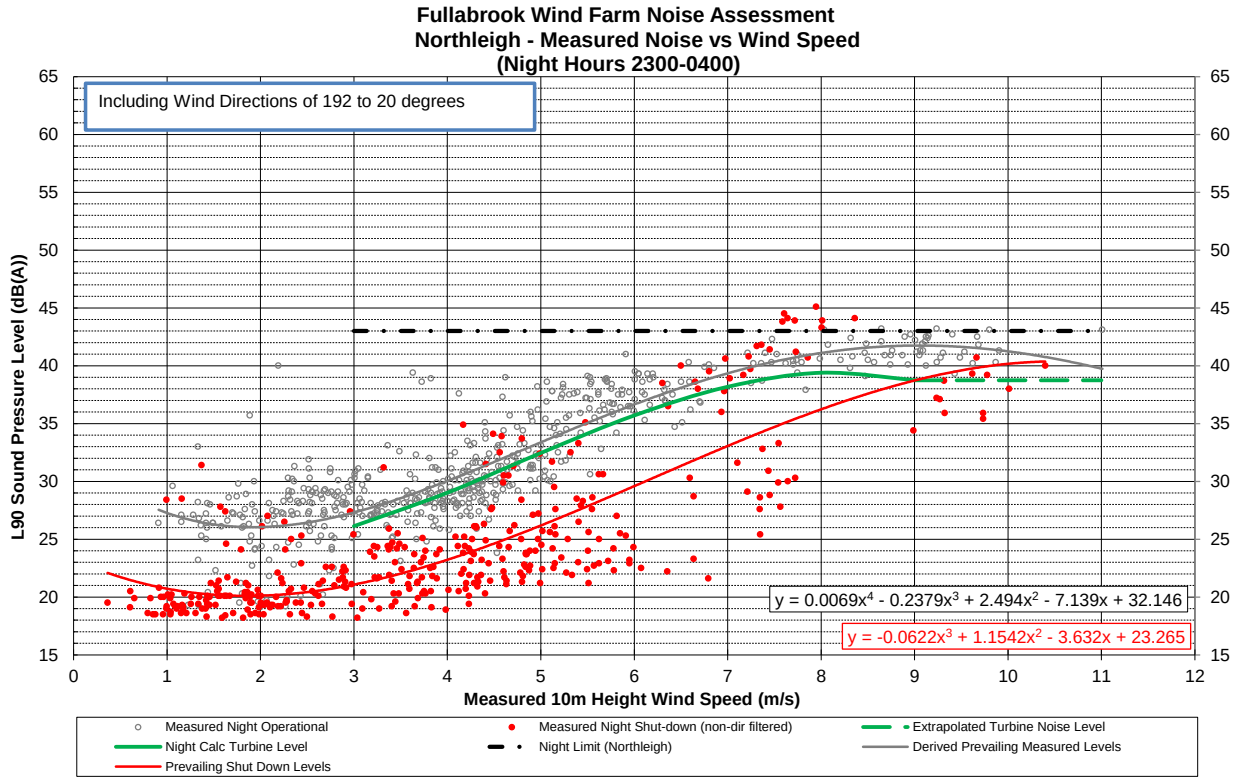


Figure 31 Northleigh Noise Compliance Assessment Chart 3

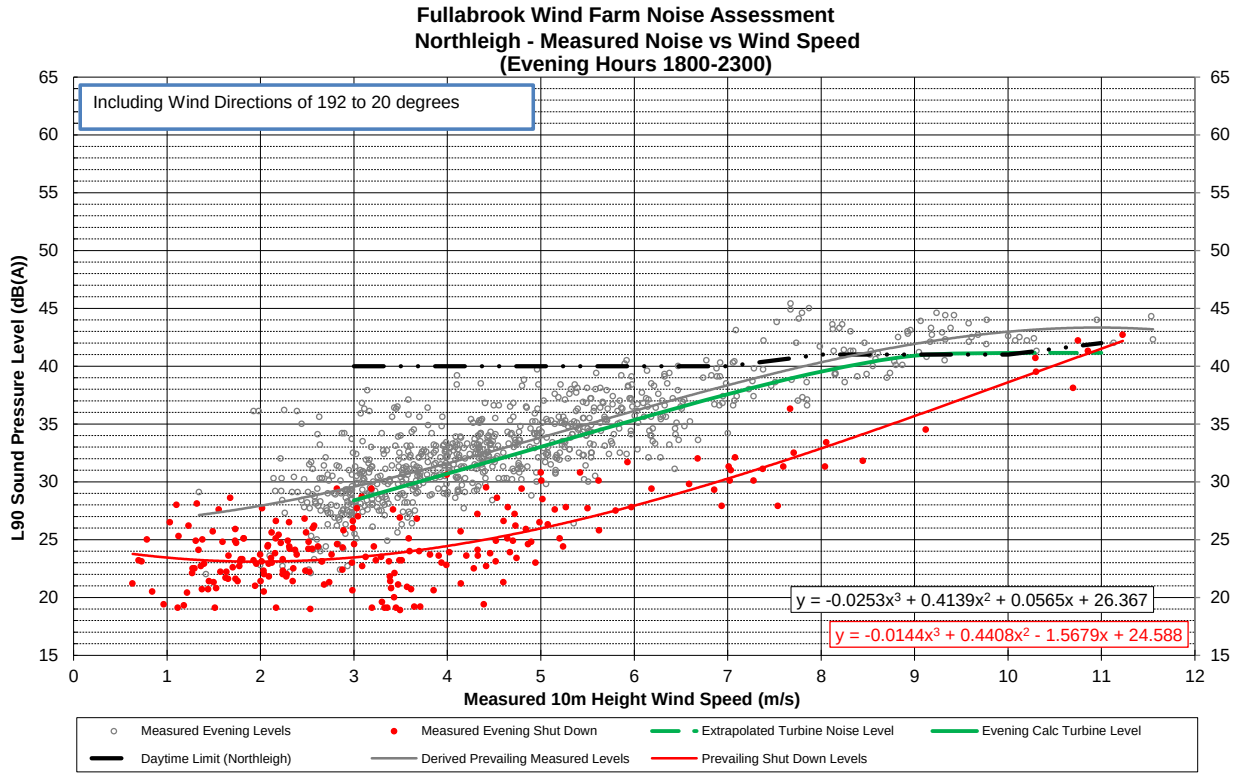


Figure 32 Northleigh Noise Compliance Assessment Chart 4

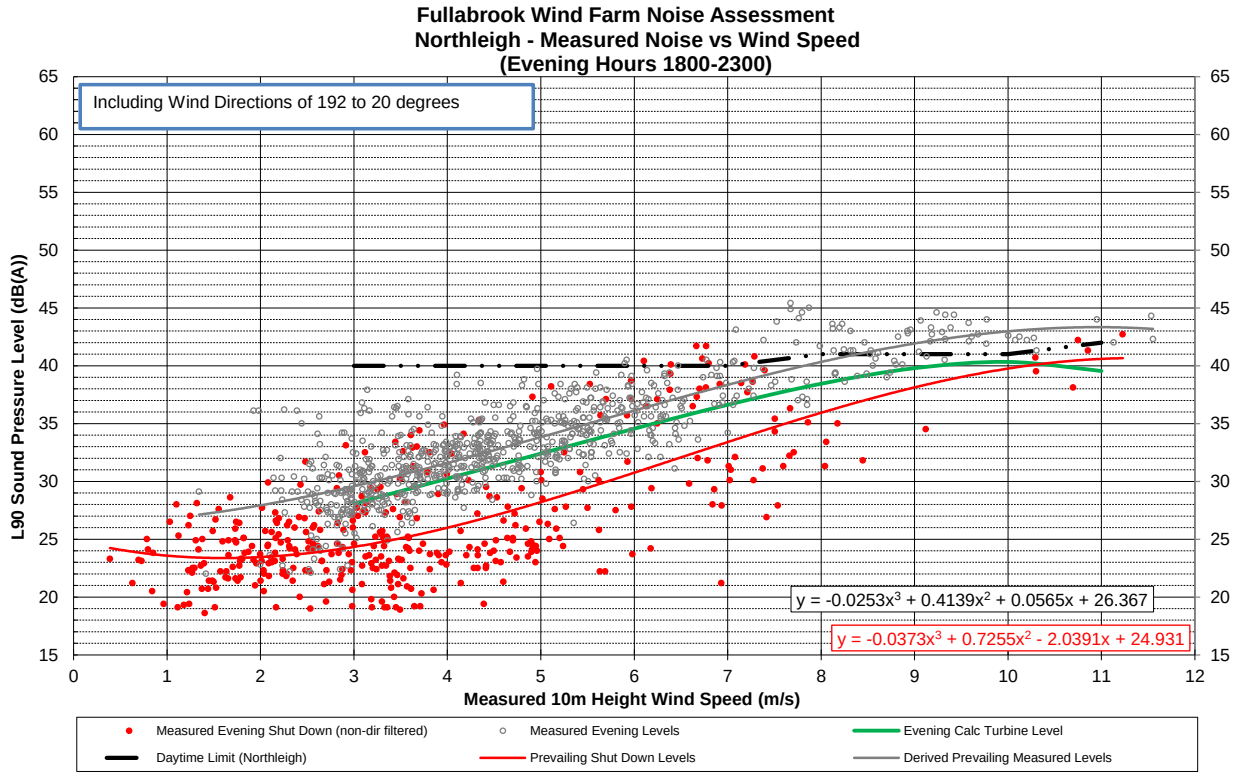


Figure 33 Northleigh Noise Compliance Assessment Chart 5

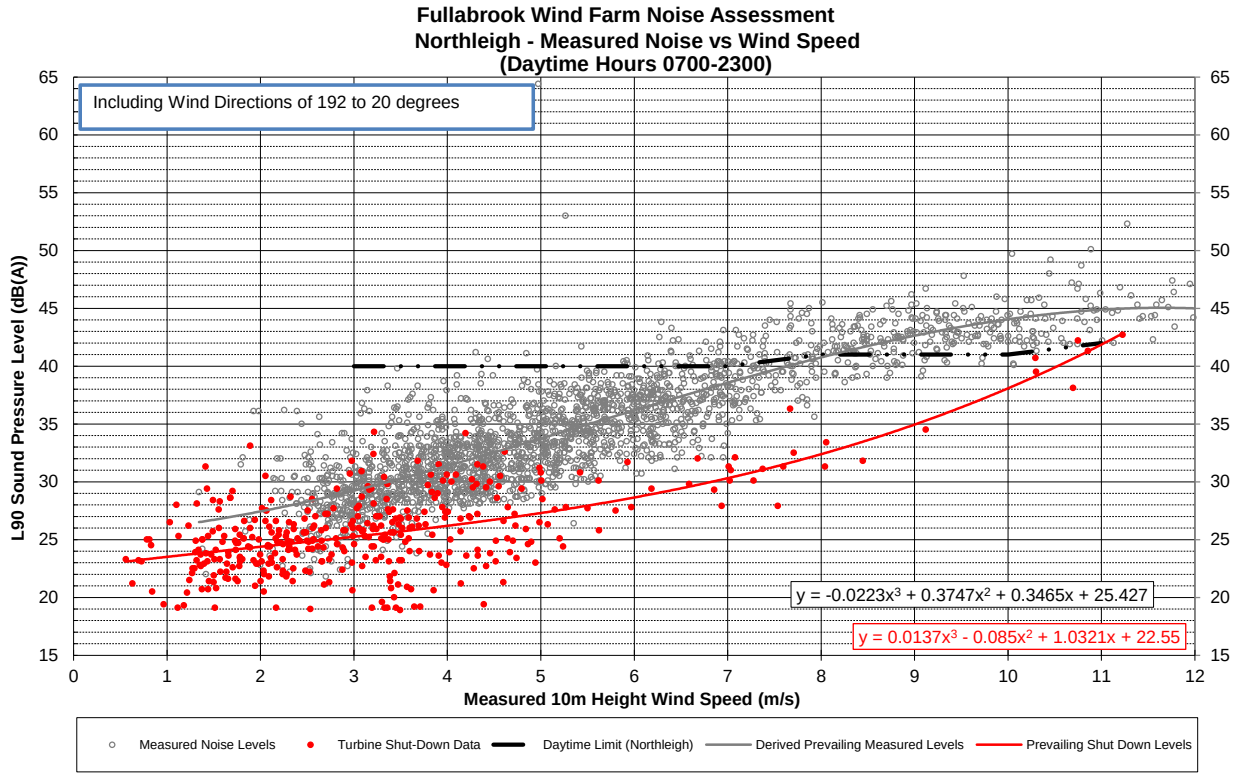
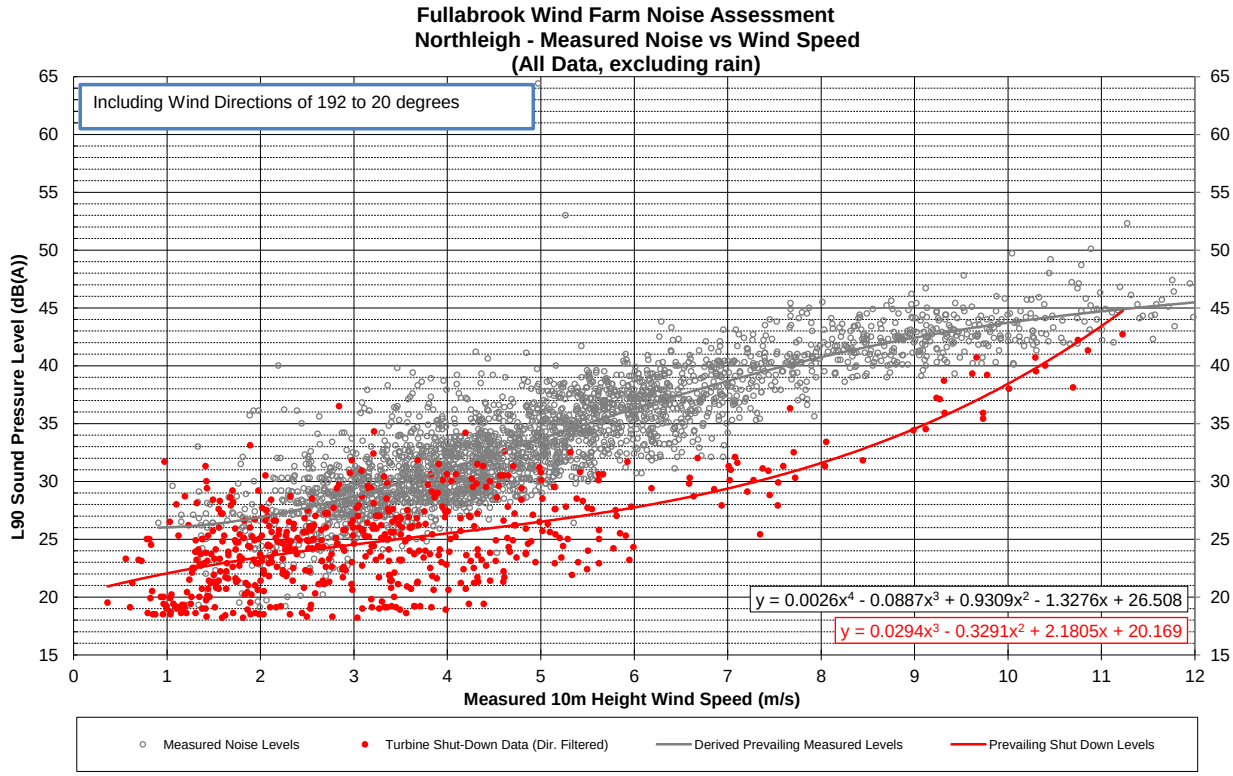


Figure 34 Northleigh Noise Compliance Assessment Chart 6



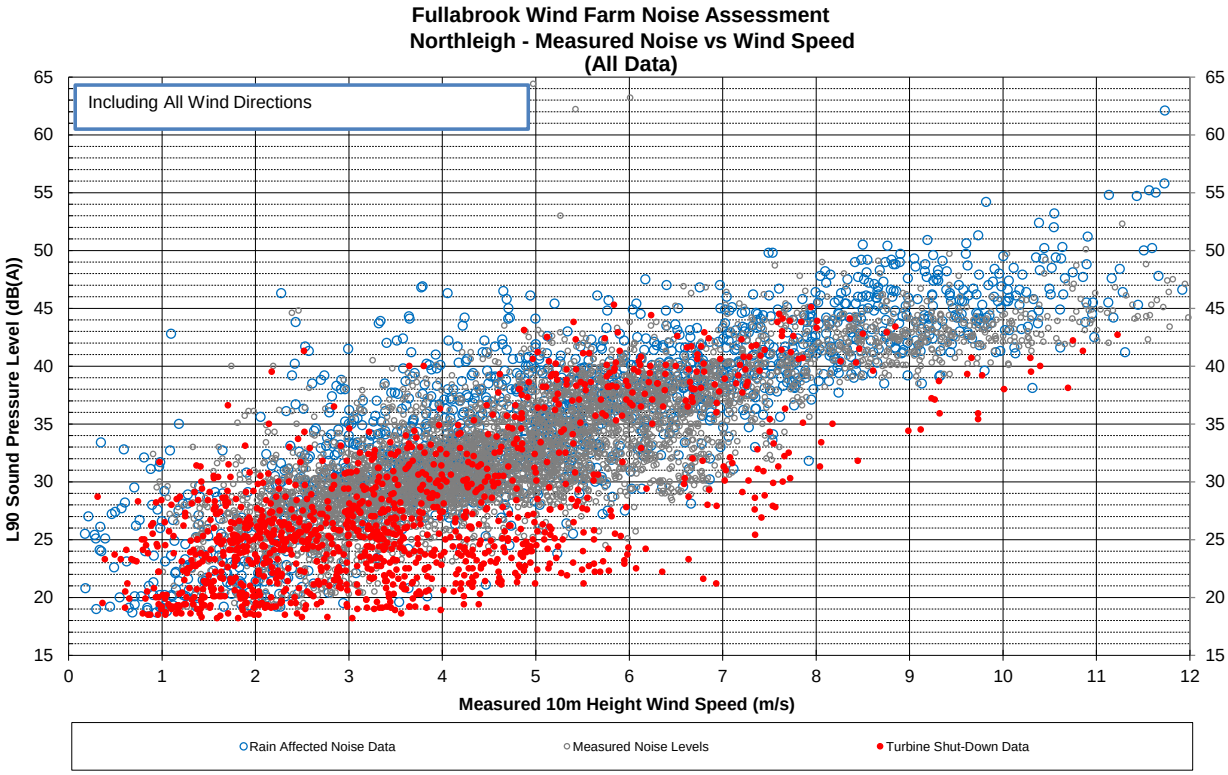

Fullabrook Wind Farm Noise Assessment
Northleigh - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 36 Greenhill Noise Compliance Assessment Chart 1

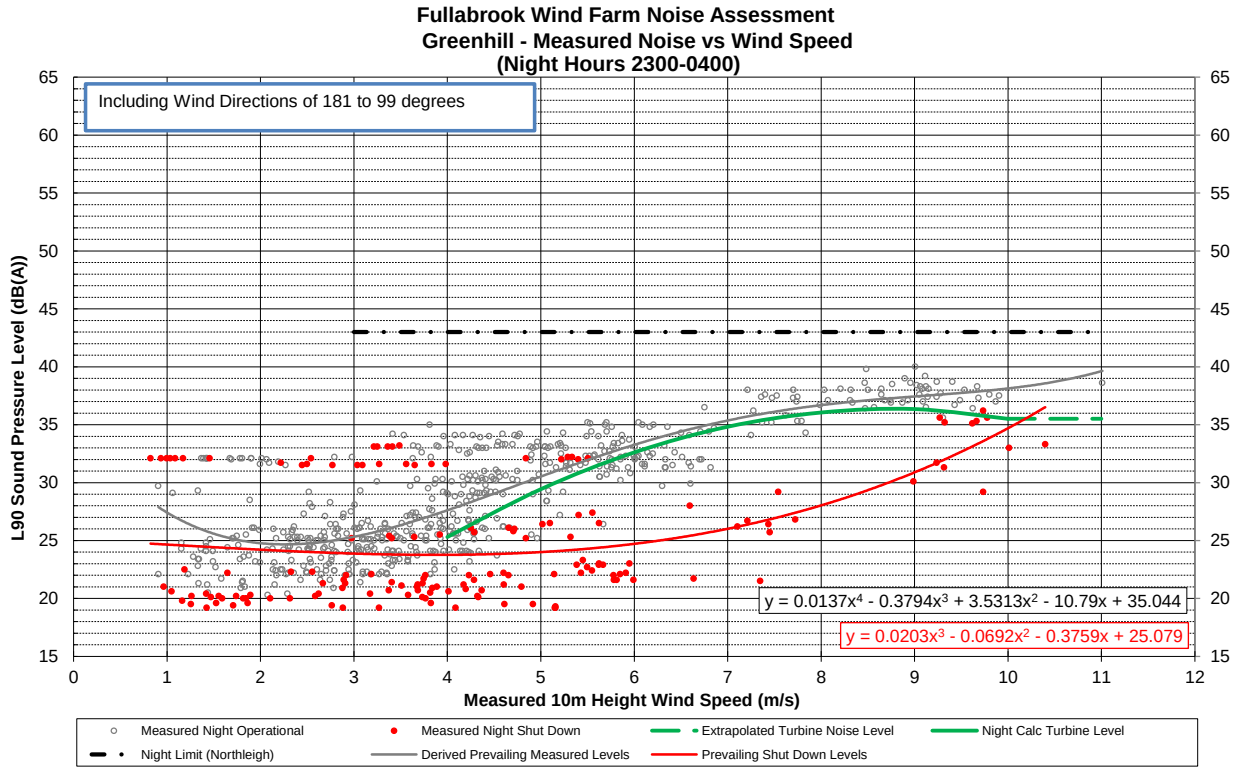


Figure 37 Greenhill Noise Compliance Assessment Chart 2

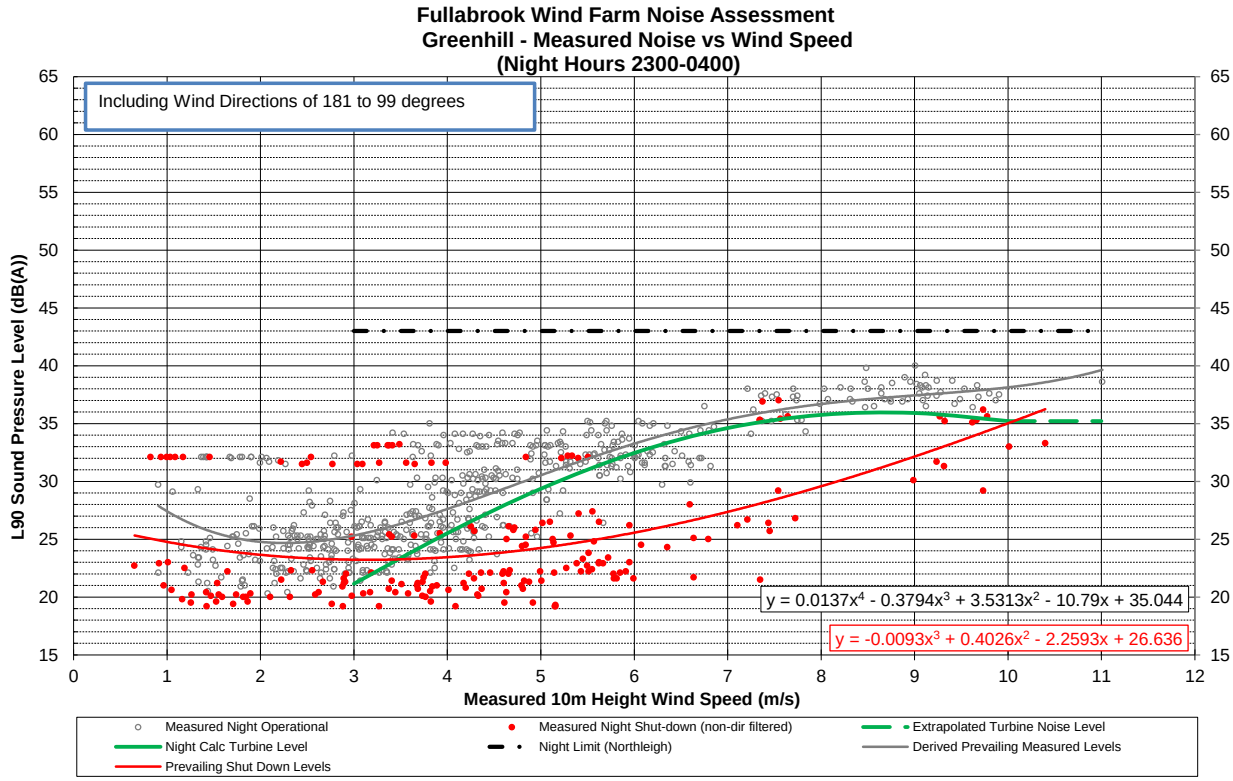


Figure 38 Greenhill Noise Compliance Assessment Chart 3

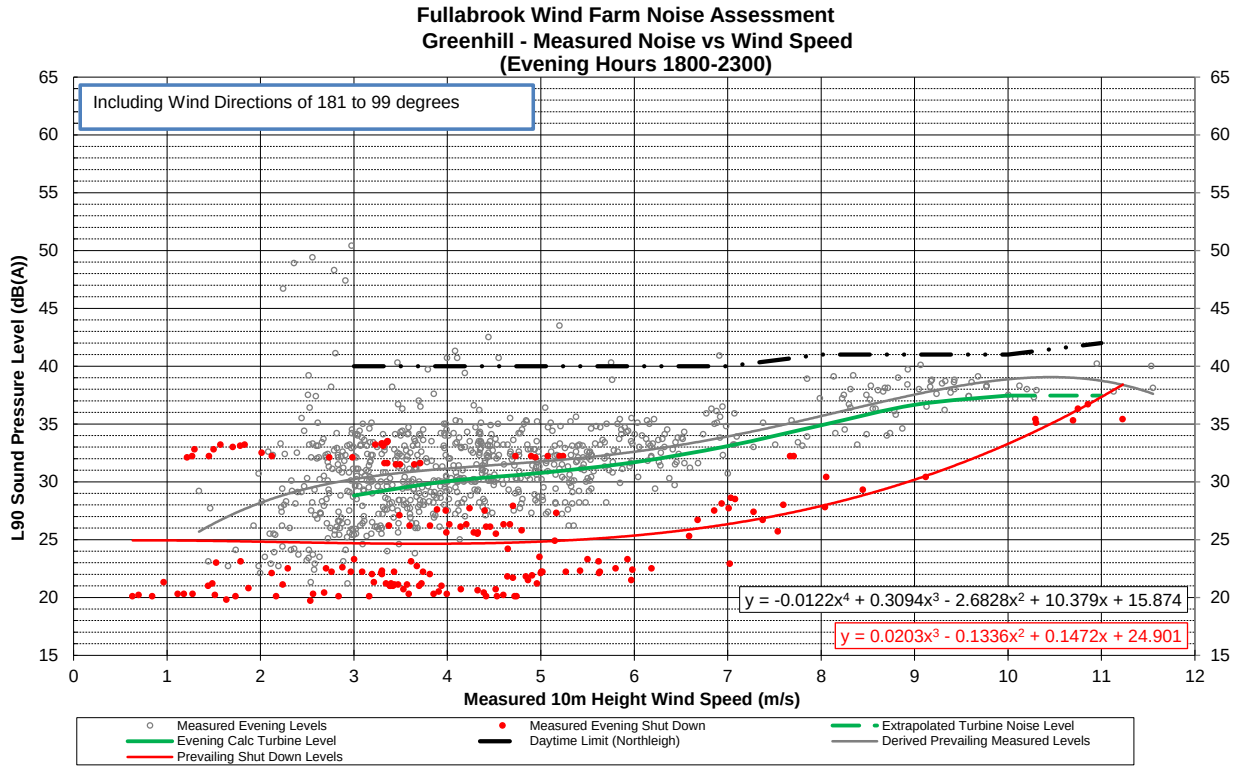


Figure 39 Greenhill Noise Compliance Assessment Chart 4

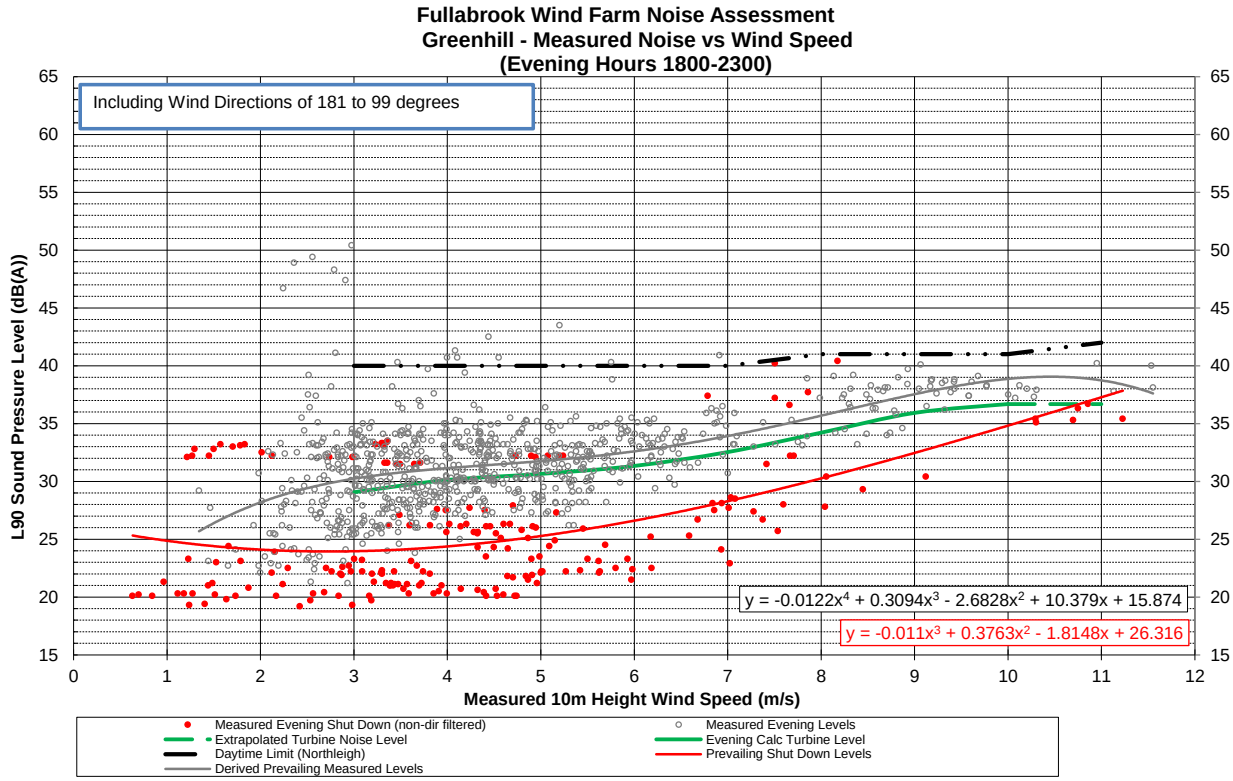


Figure 40 Greenhill Noise Compliance Assessment Chart 5

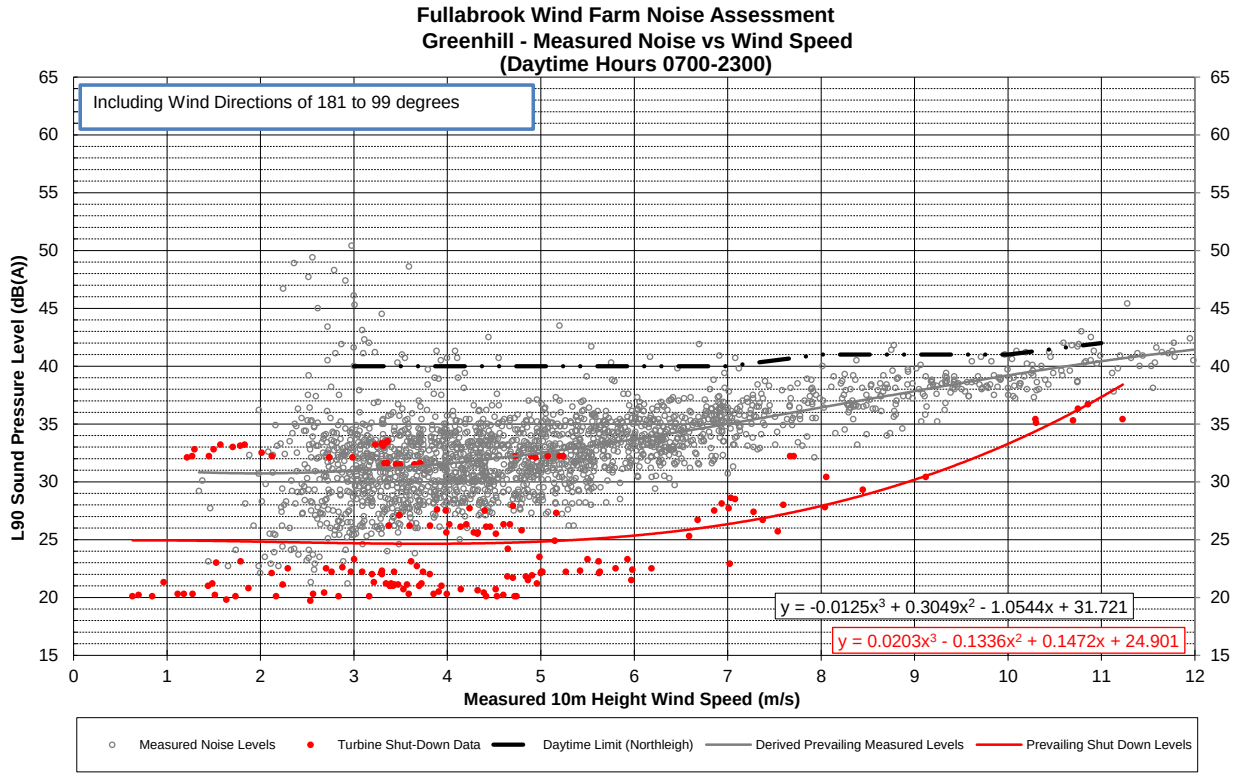


Figure 41 Greenhill Noise Compliance Assessment Chart 6

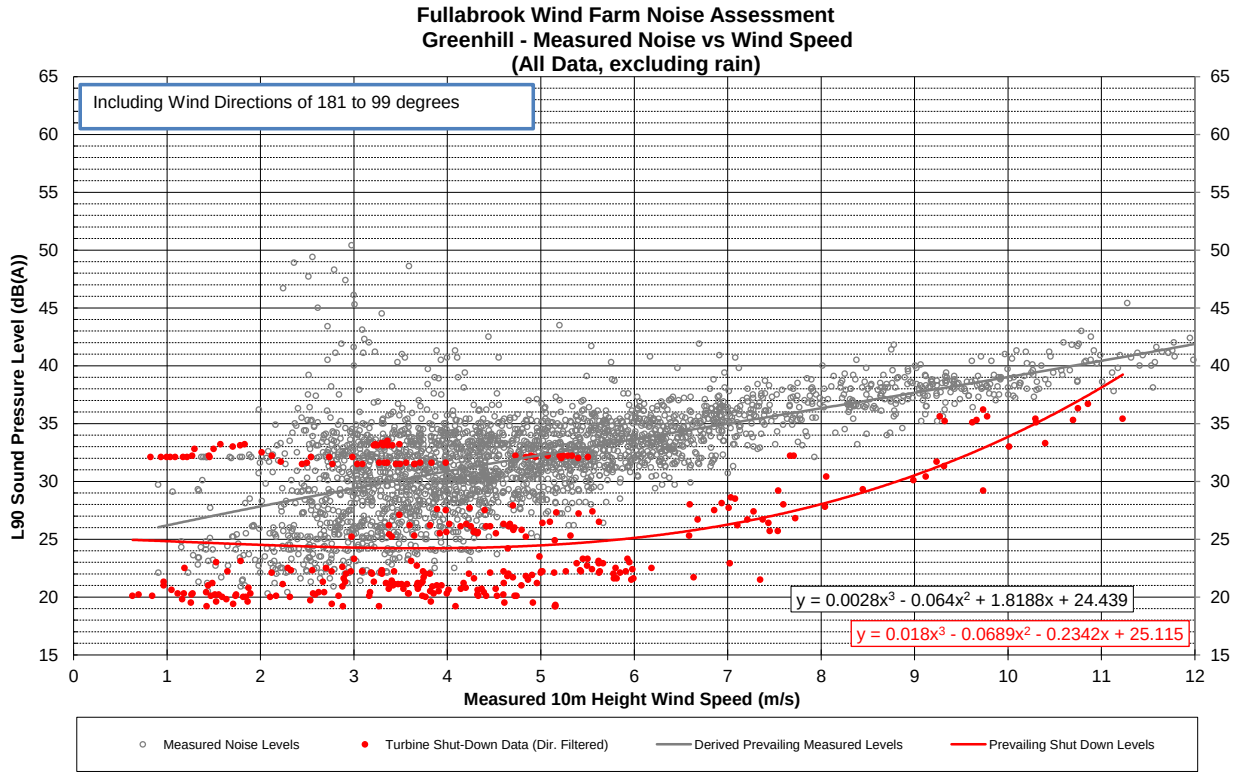


Figure 42 Greenhill Noise Compliance Assessment Chart 7

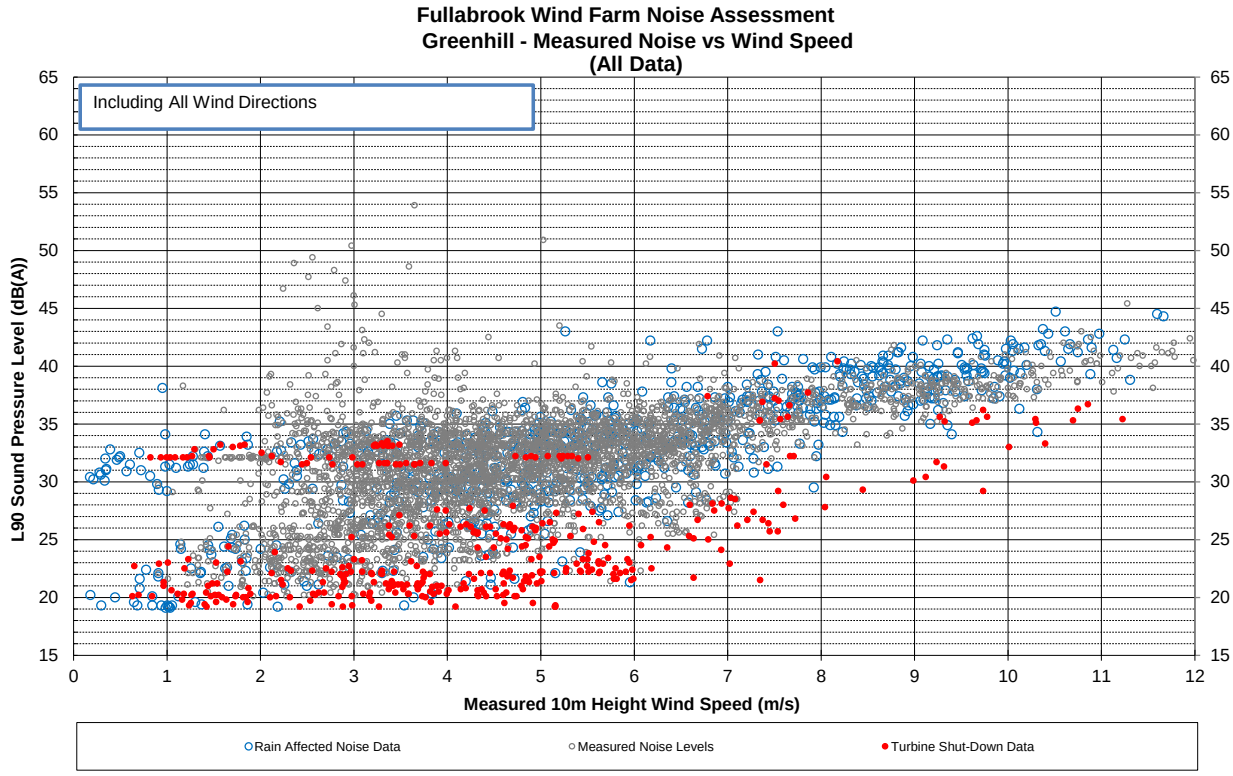


Figure 43 Greenhill Alternative Noise Compliance Assessment Chart 1

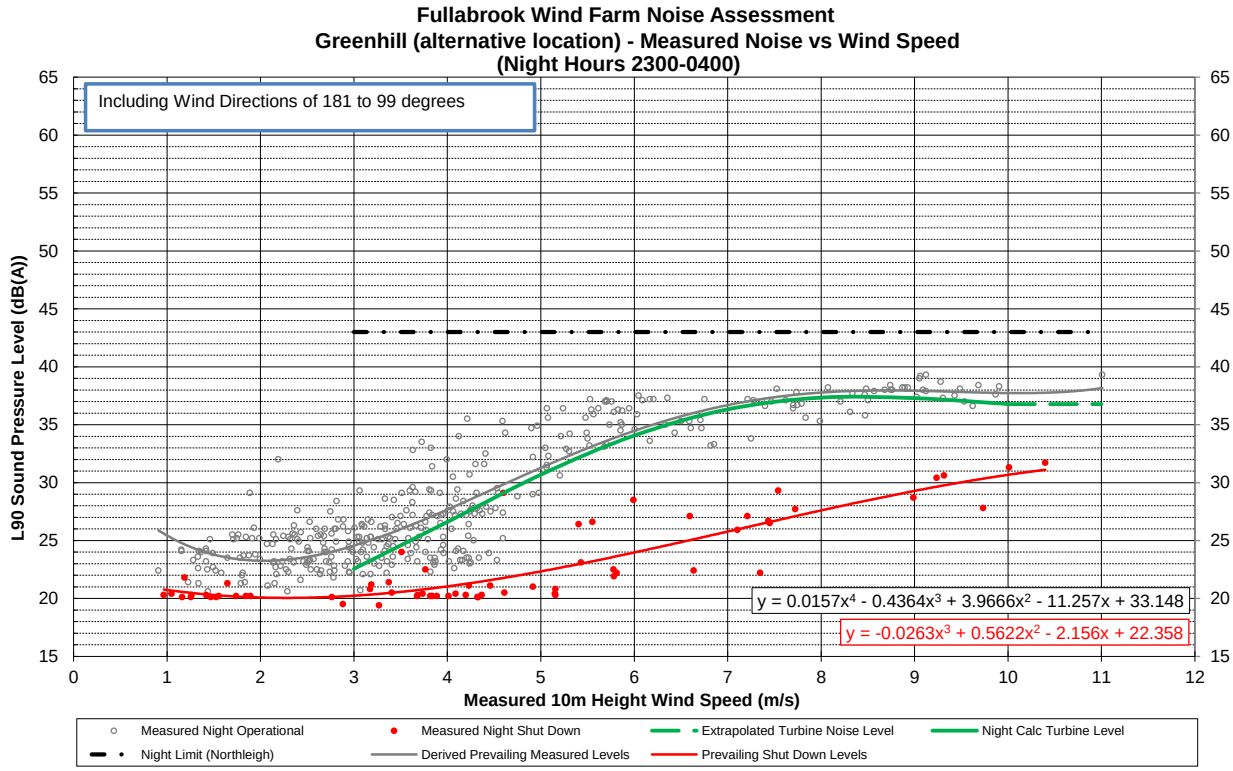


Figure 44 Greenhill Alternative Noise Compliance Assessment Chart 2

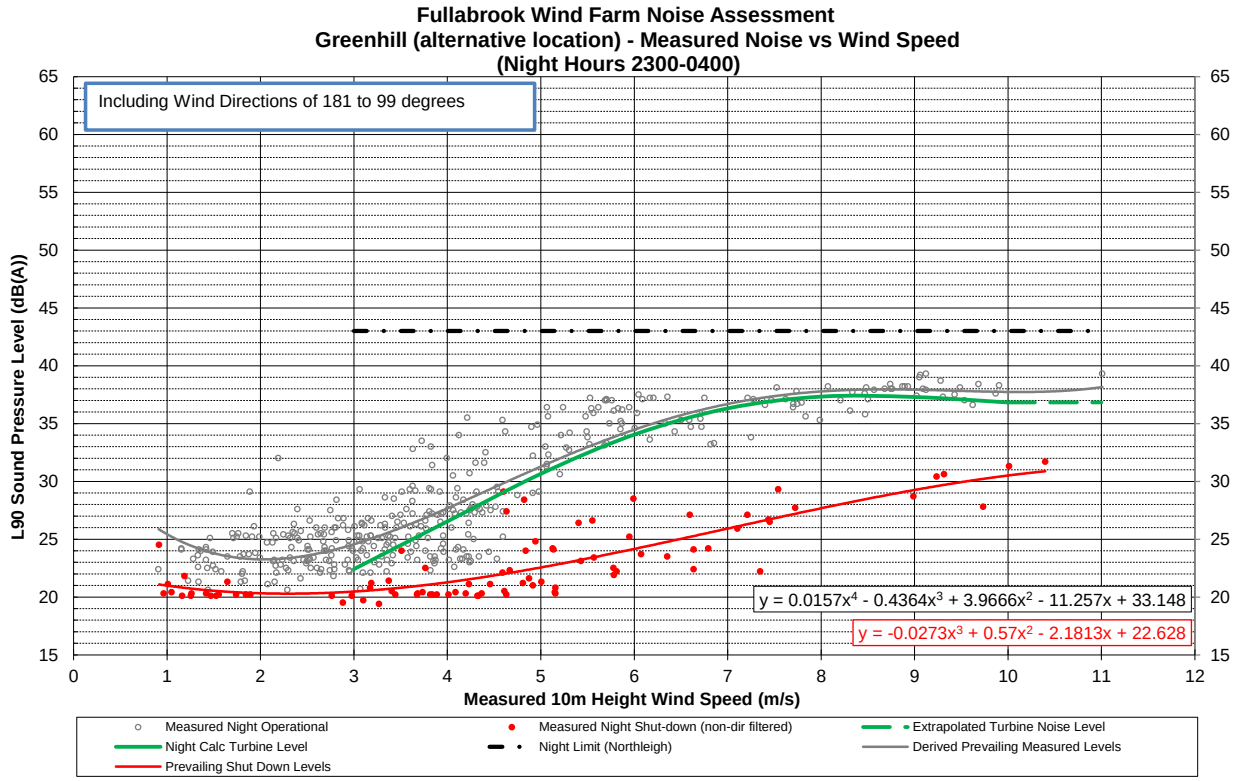


Figure 45 Greenhill Alternative Noise Compliance Assessment Chart 3

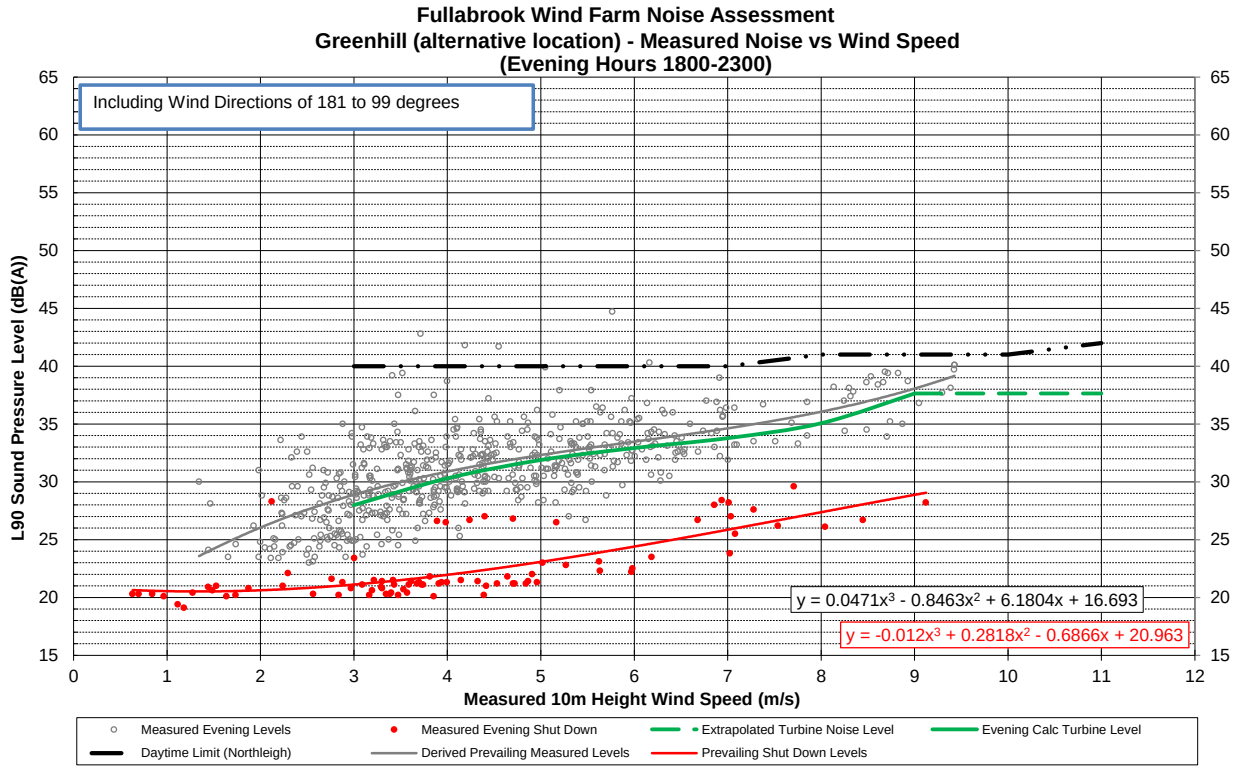


Figure 46 Greenhill Alternative Noise Compliance Assessment Chart 4

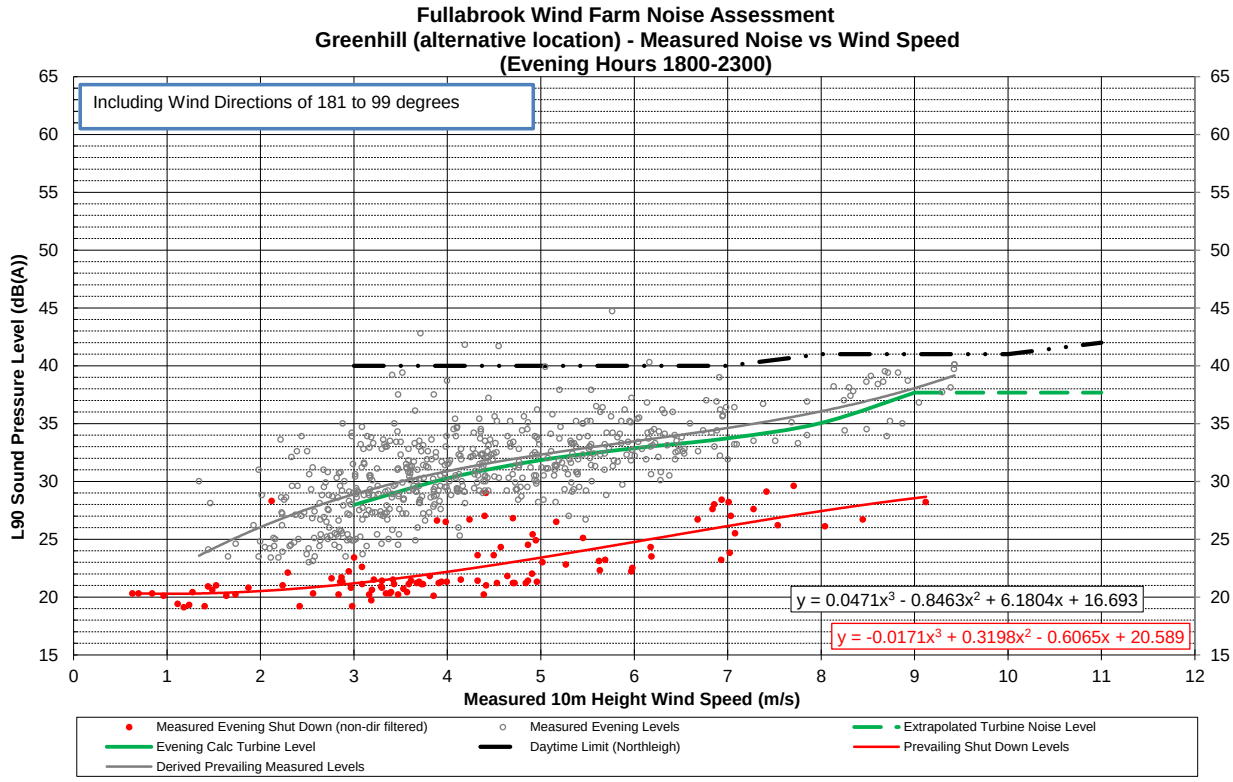


Figure 47 Greenhill Alternative Noise Compliance Assessment Chart 5

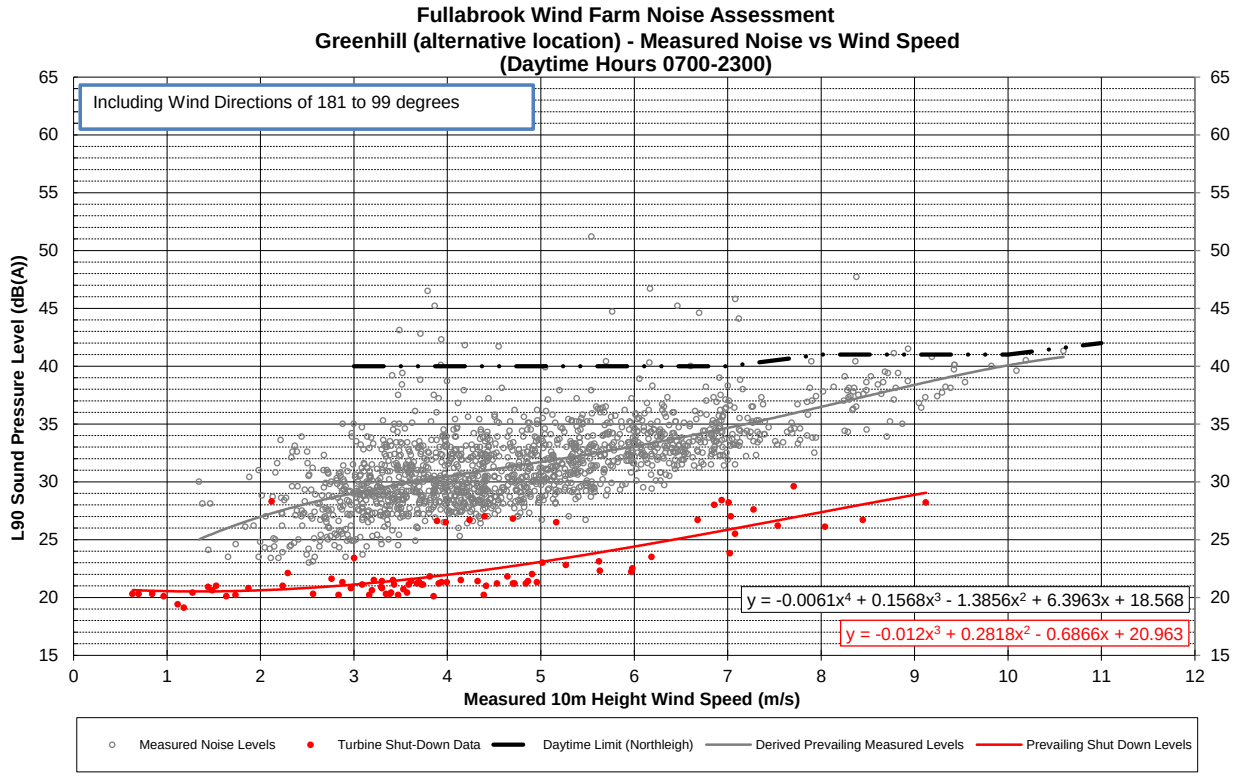
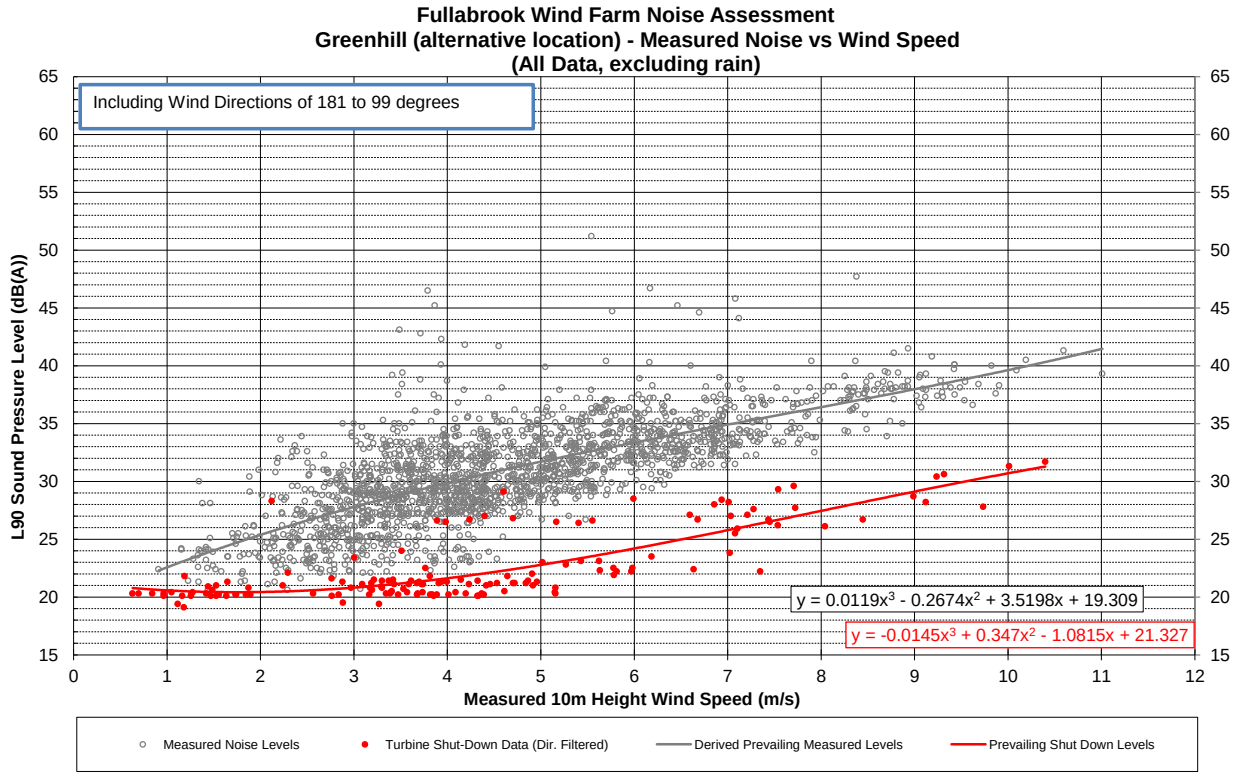


Figure 48 Greenhill Alternative Noise Compliance Assessment Chart 6



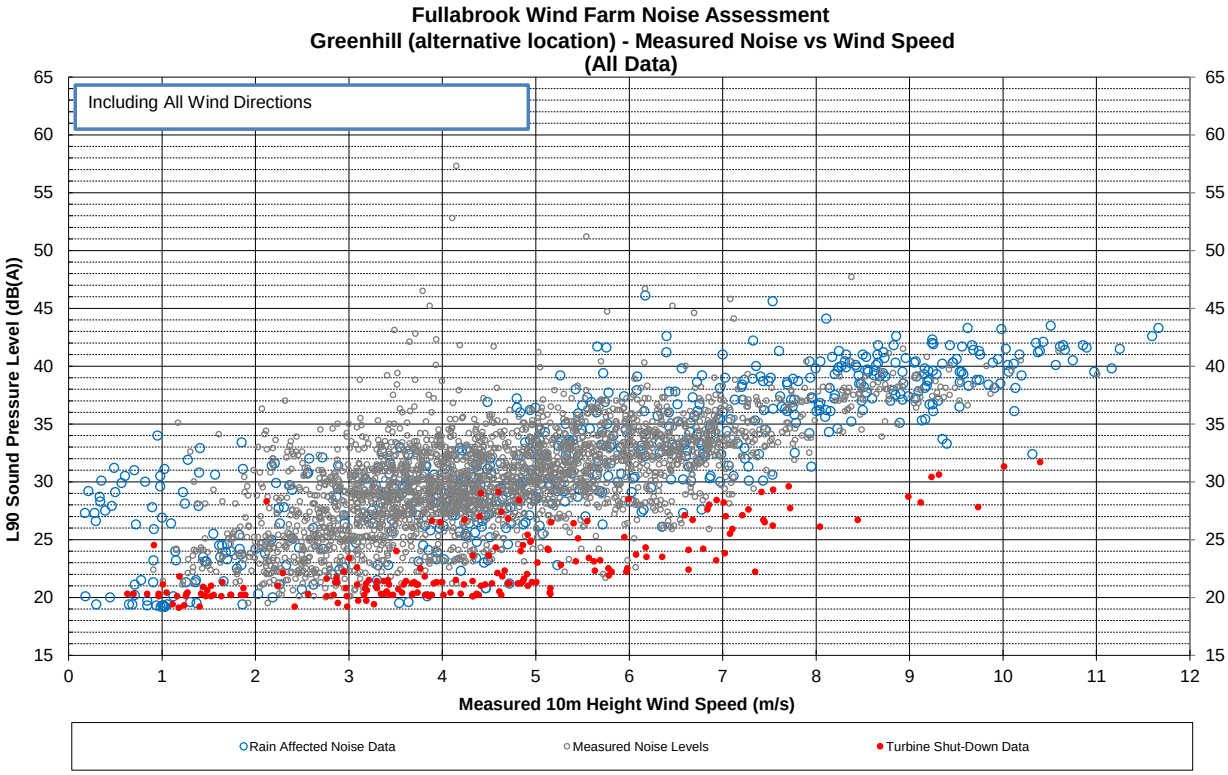

Fullabrook Wind Farm Noise Assessment
Greenhill (alternative location) - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 50 Patsford Noise Compliance Assessment Chart 1

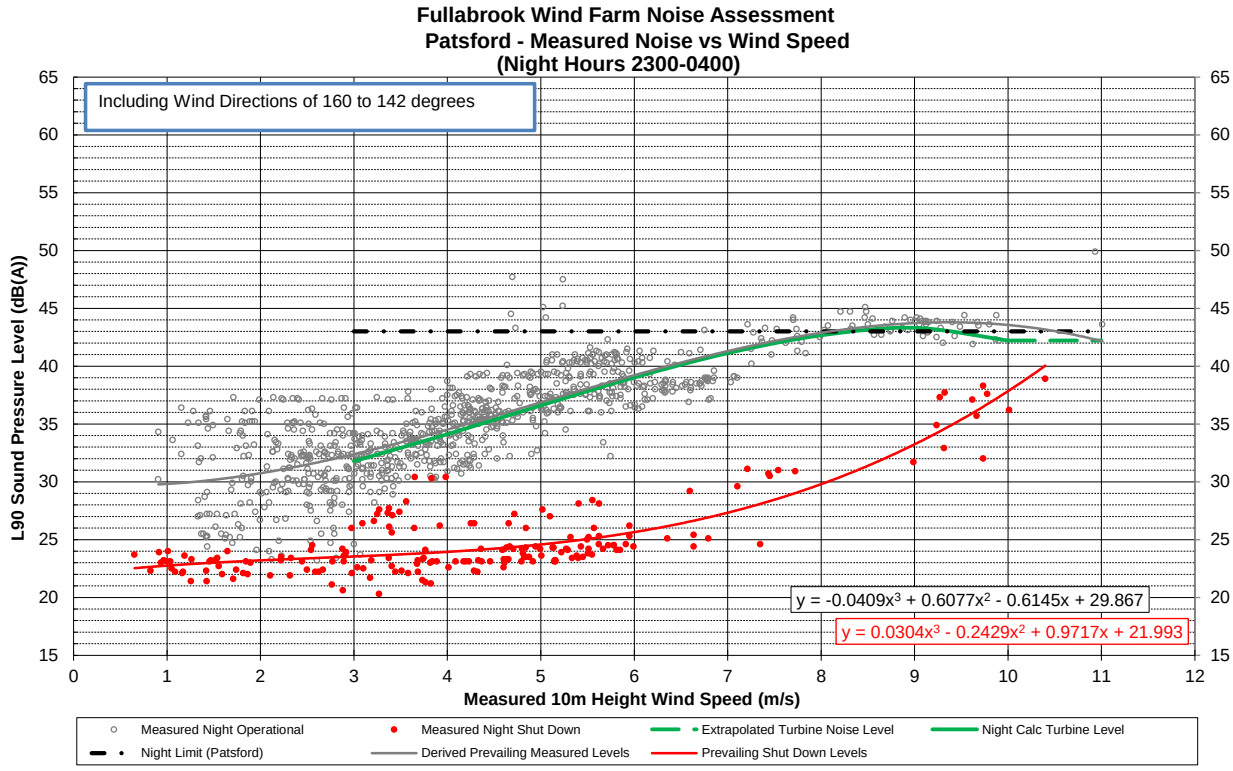


Figure 51 Patsford Noise Compliance Assessment Chart 2

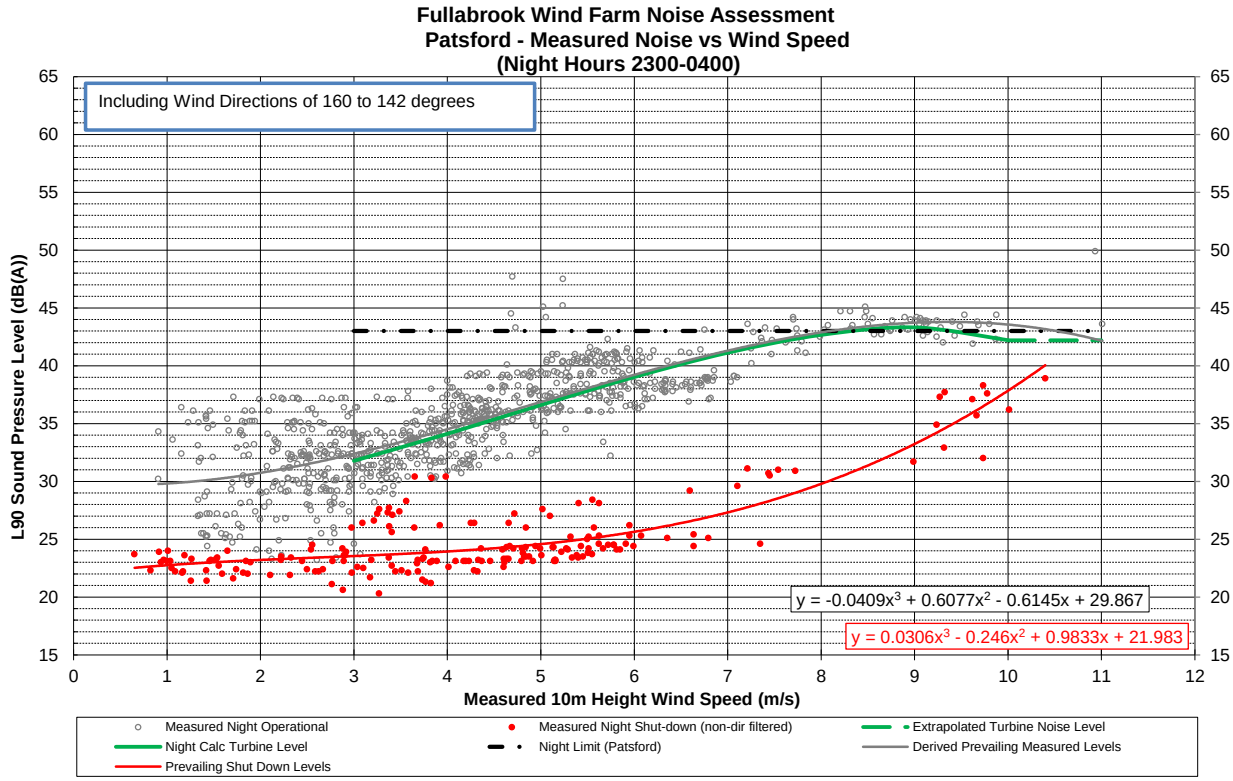


Figure 52 Patsford Noise Compliance Assessment Chart 3

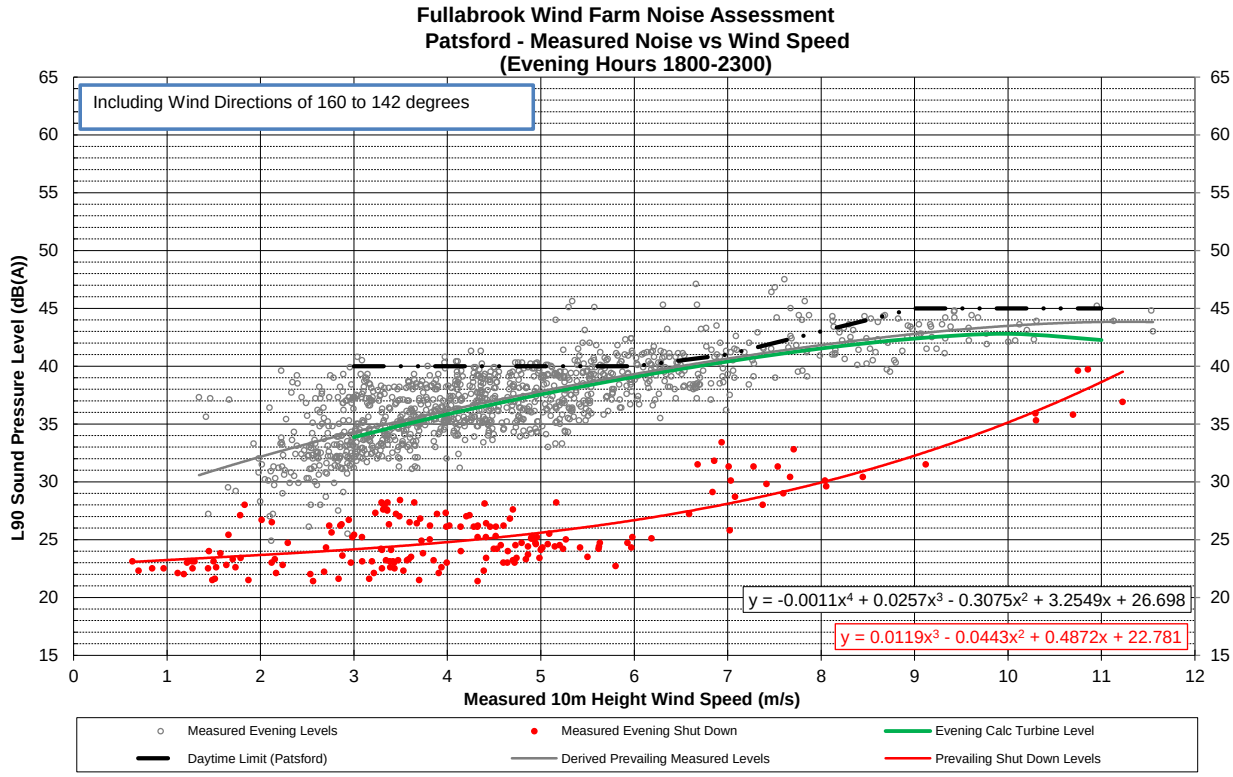


Figure 53 Patsford Noise Compliance Assessment Chart 4

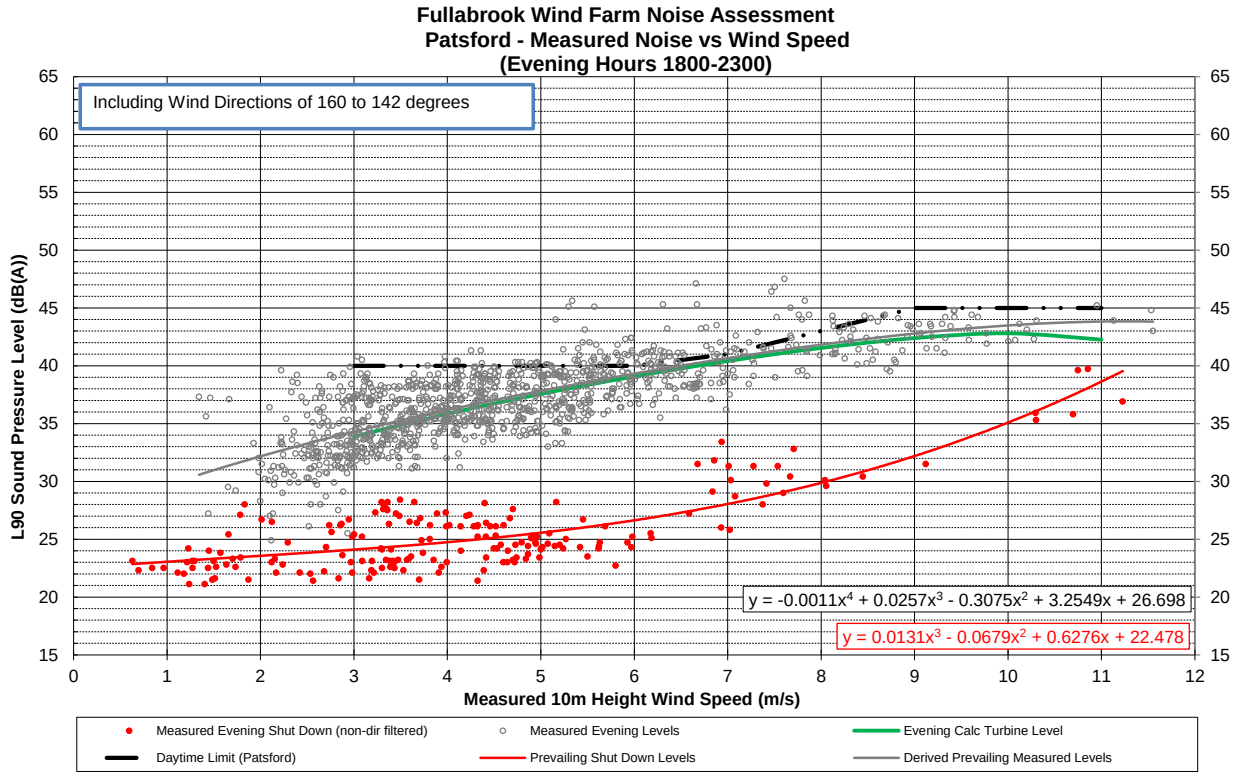


Figure 54 Patsford Noise Compliance Assessment Chart 5

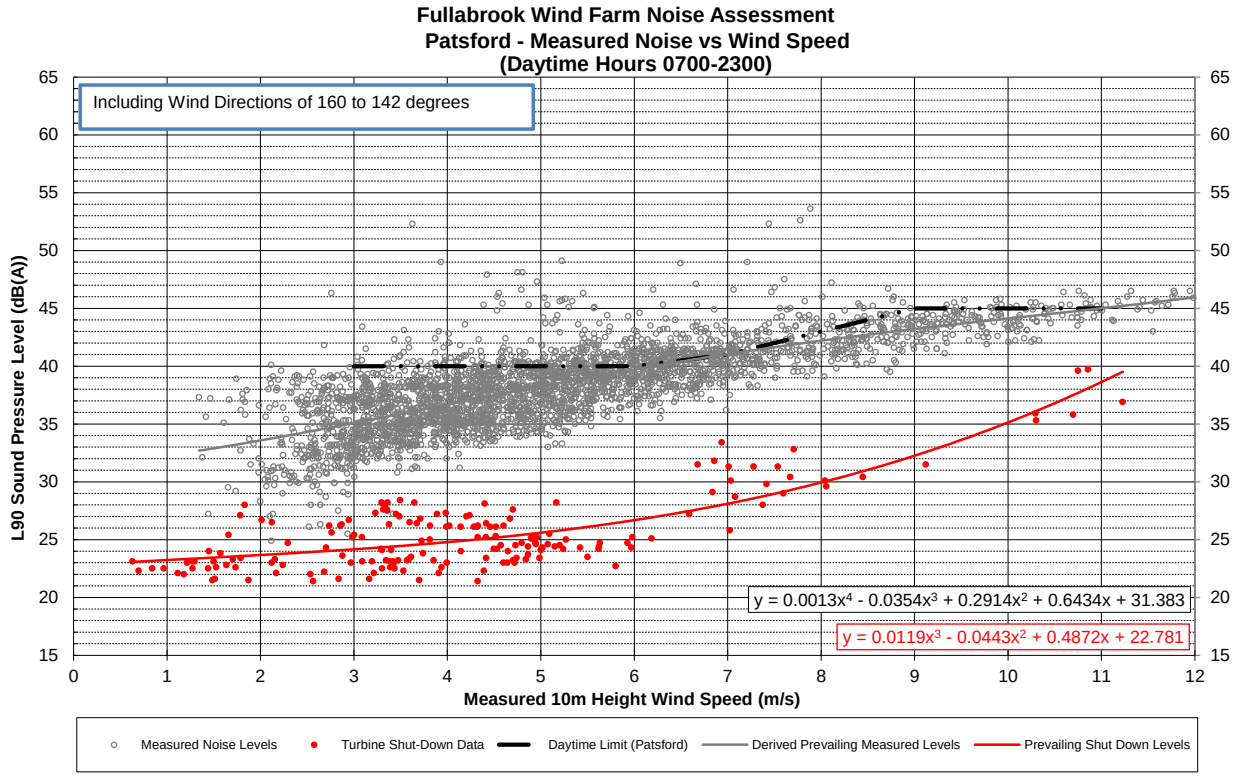
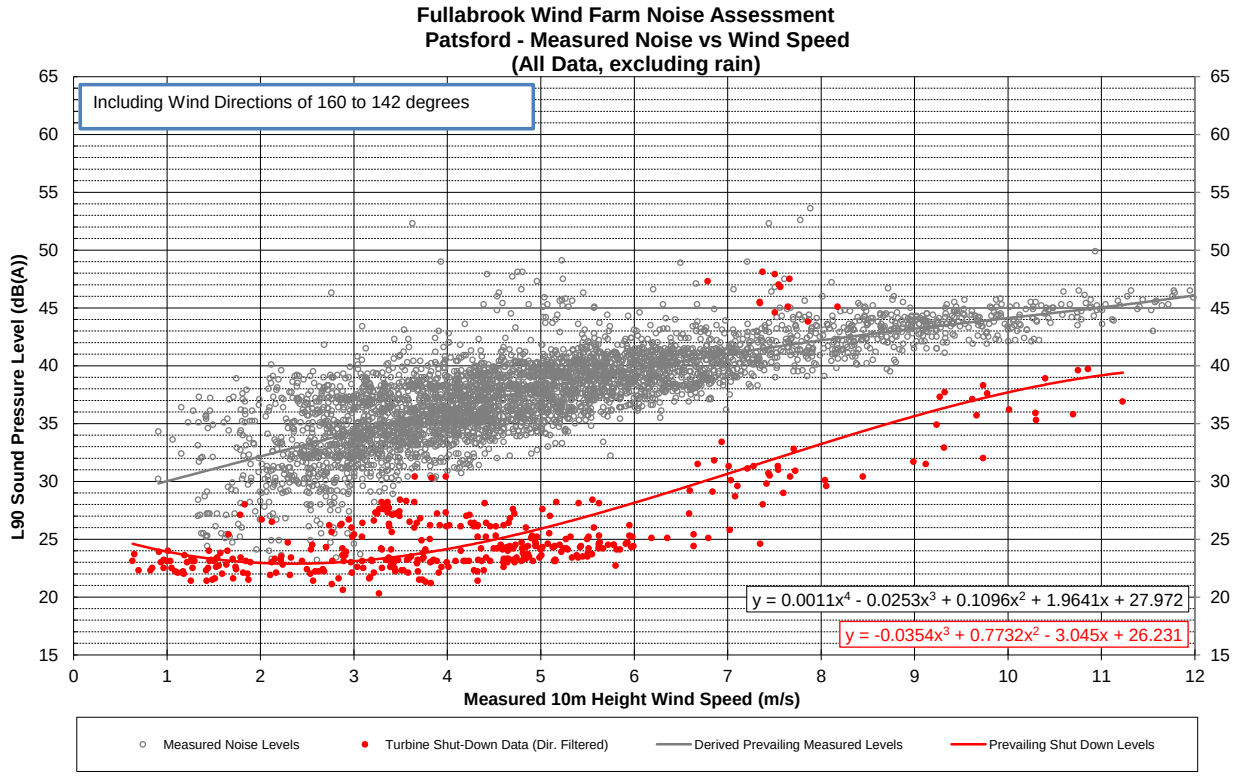


Figure 55 Patsford Noise Compliance Assessment Chart 6



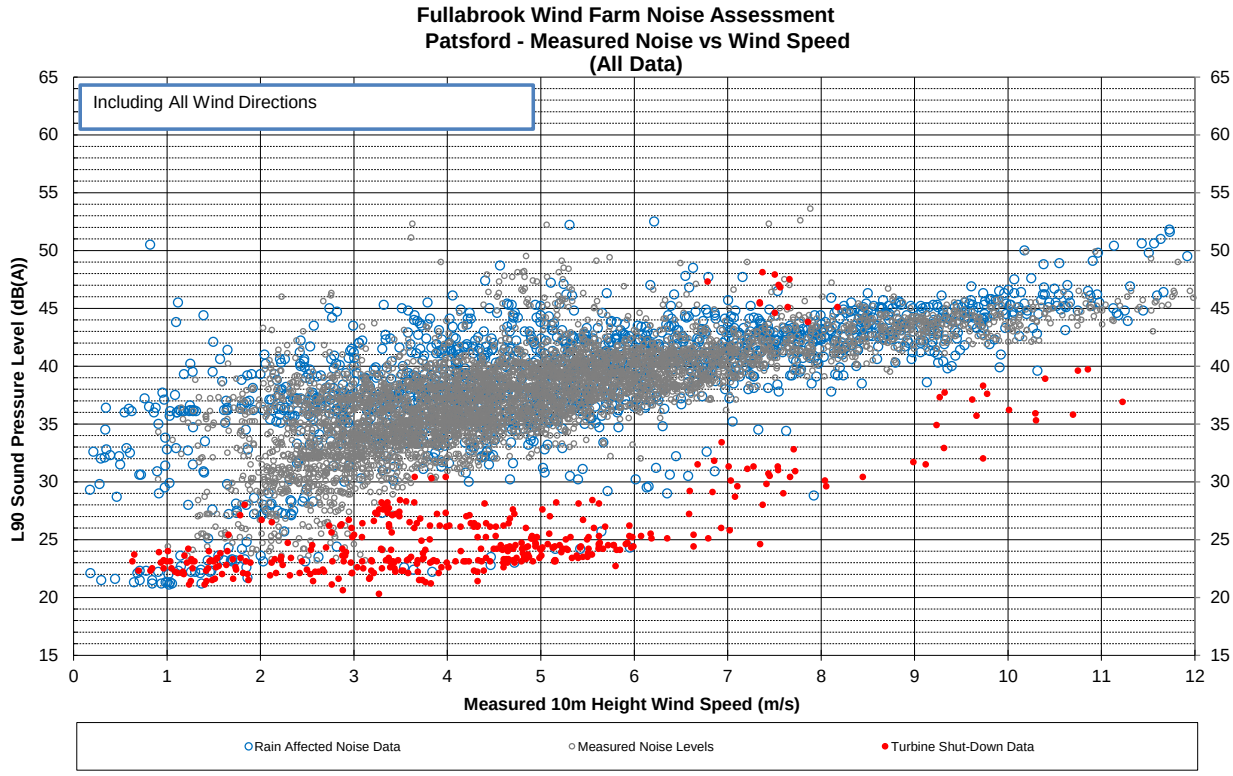

Fullabrook Wind Farm Noise Assessment
Patsford - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 57 Fullabrook Noise Compliance Assessment Chart 1

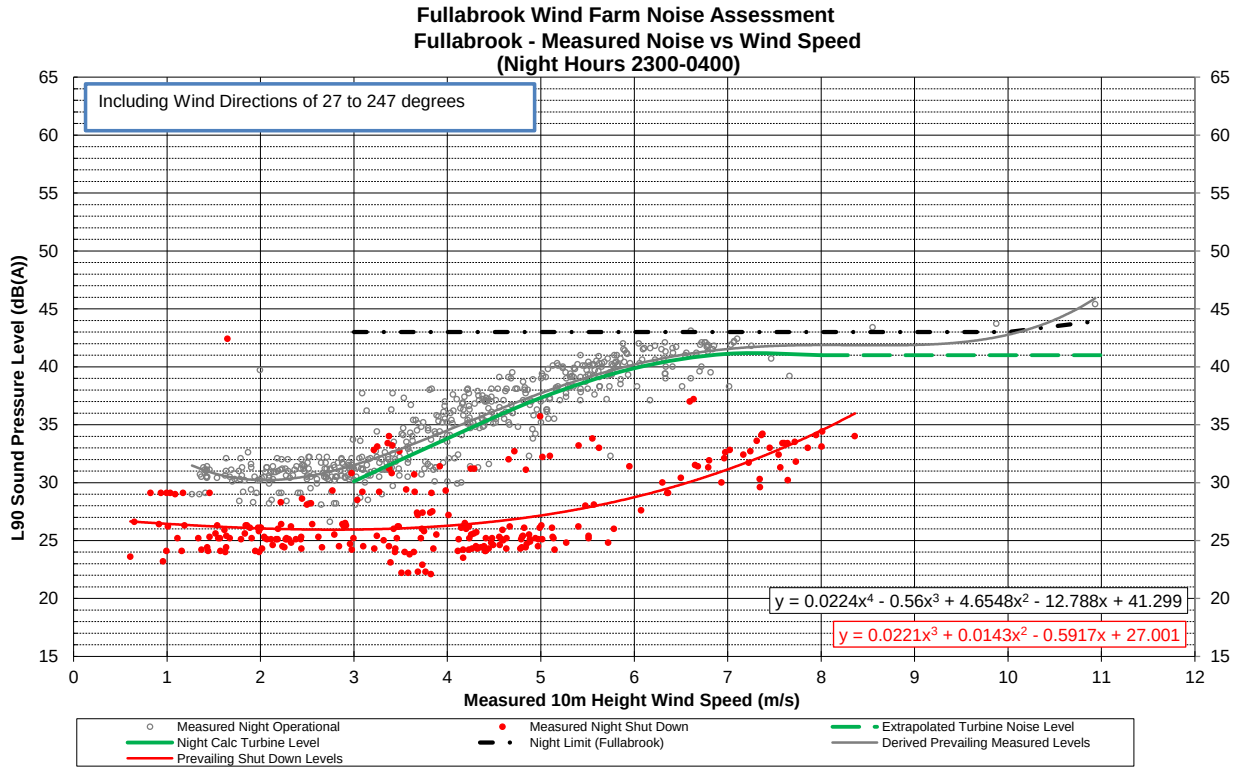


Figure 58 Fullabrook Noise Compliance Assessment Chart 2

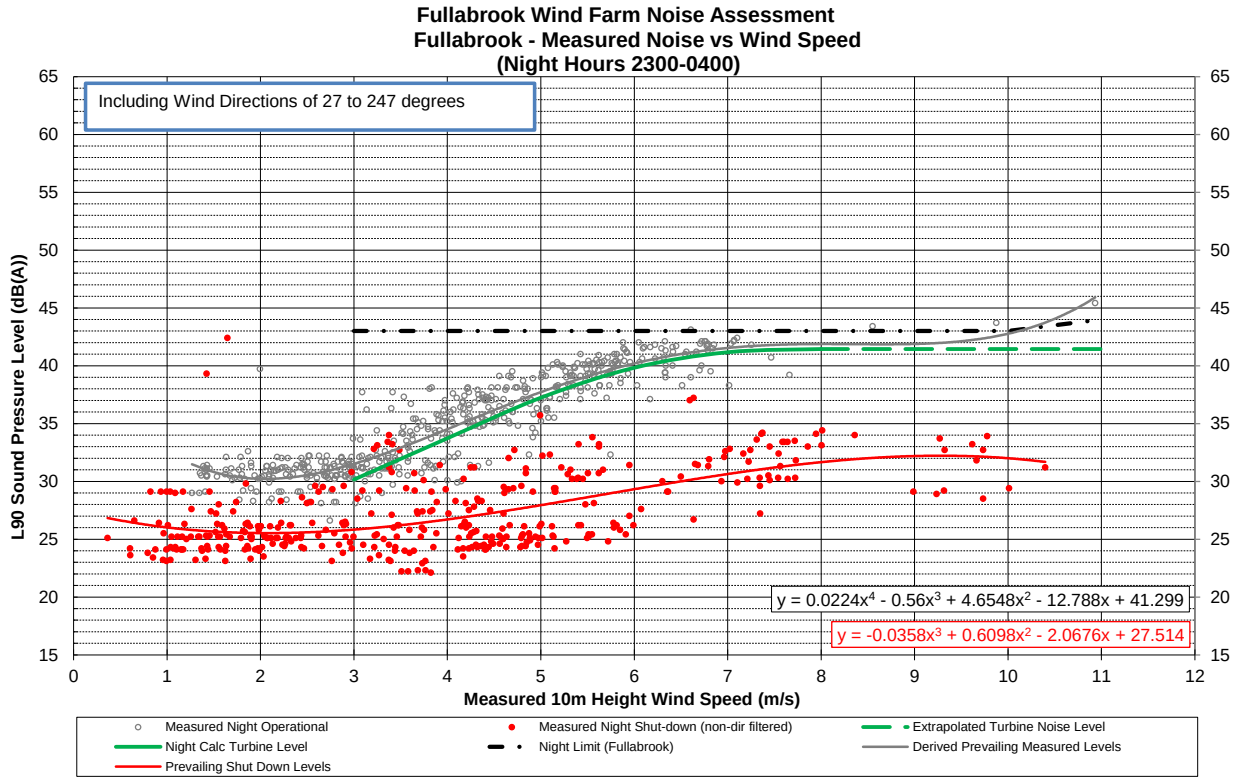


Figure 59 Fullabrook Noise Compliance Assessment Chart 3

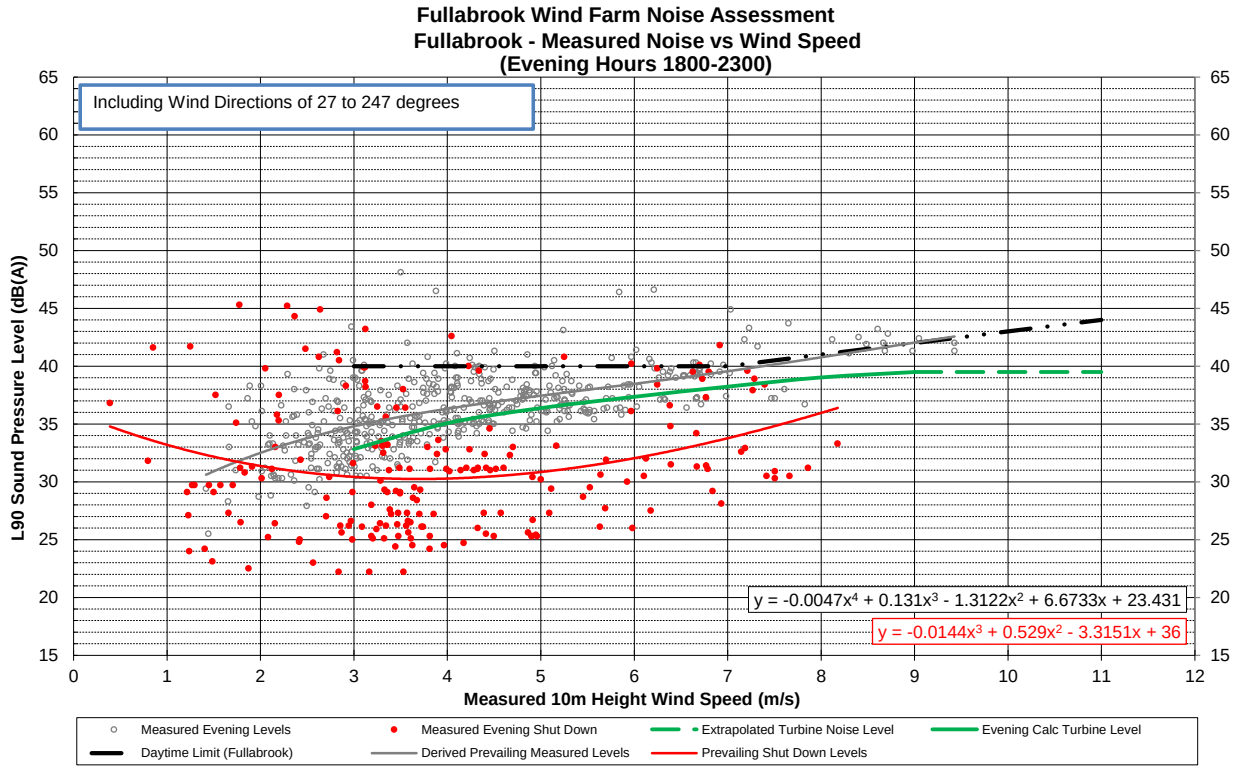


Figure 60 Fullabrook Noise Compliance Assessment Chart 4

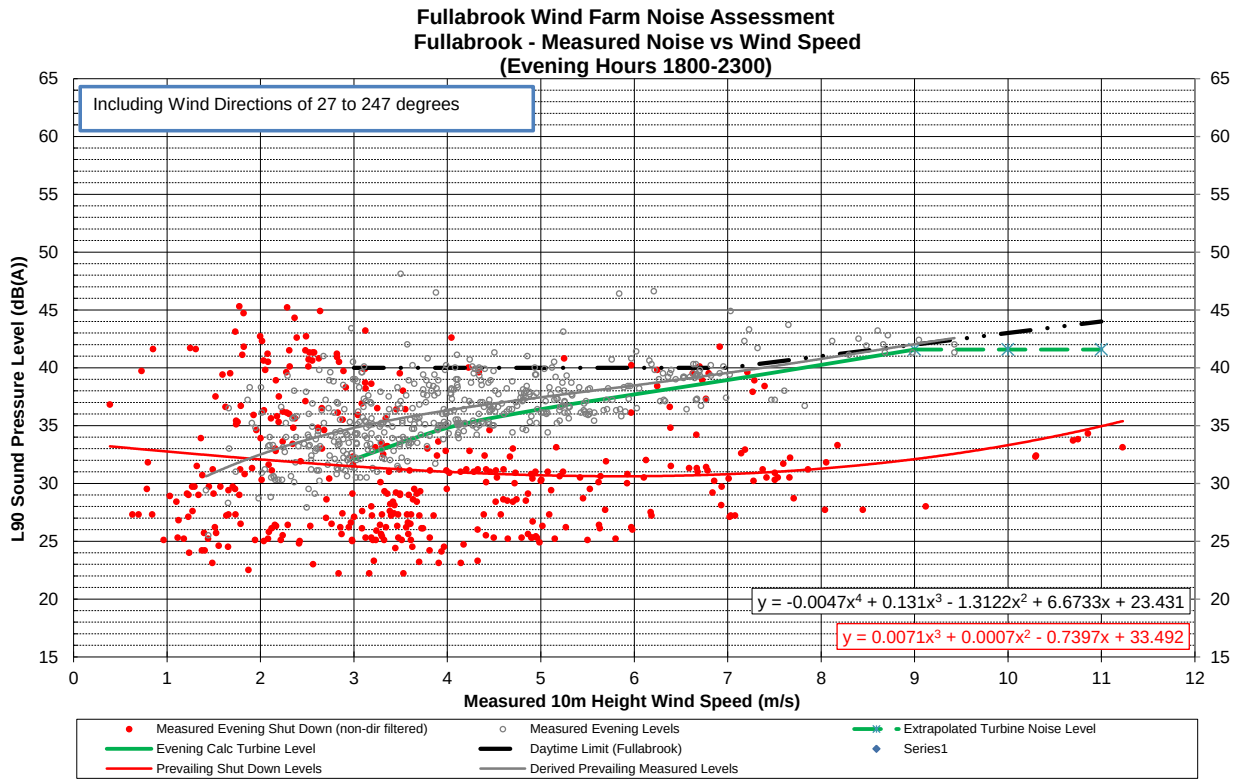


Figure 61 Fullabrook Noise Compliance Assessment Chart 5

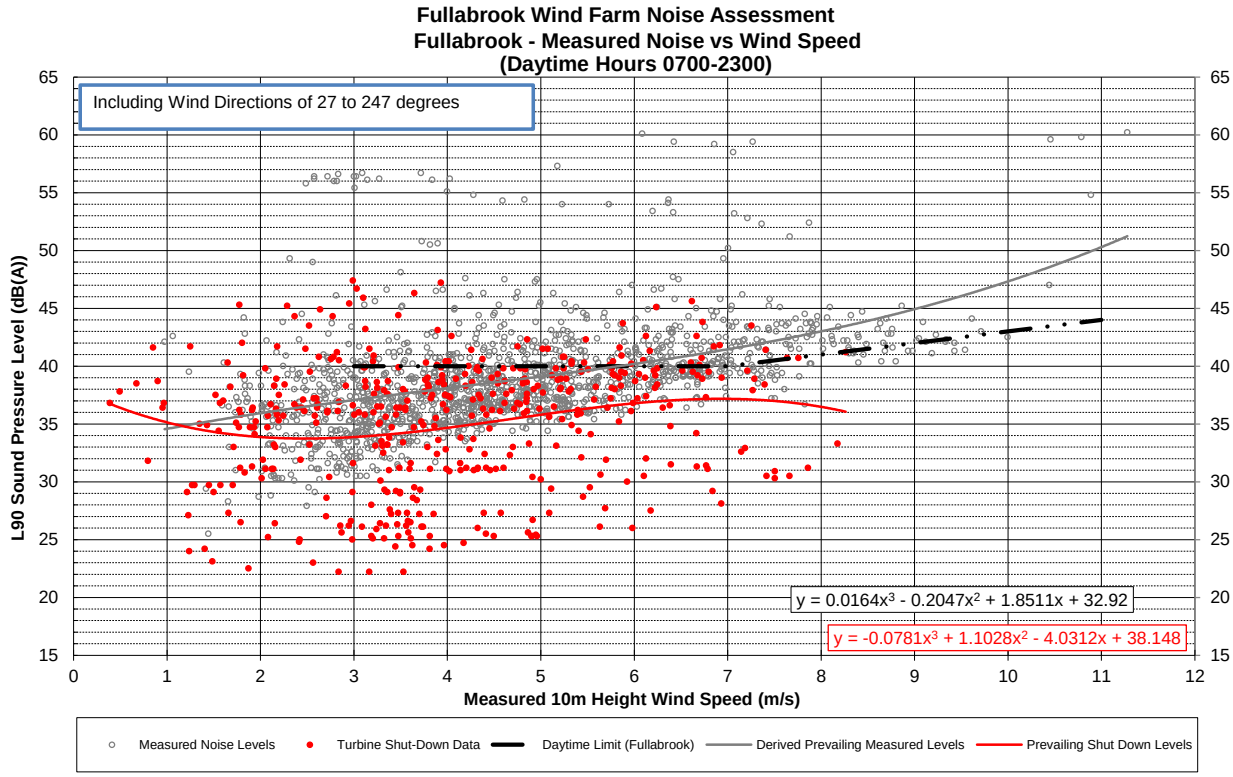
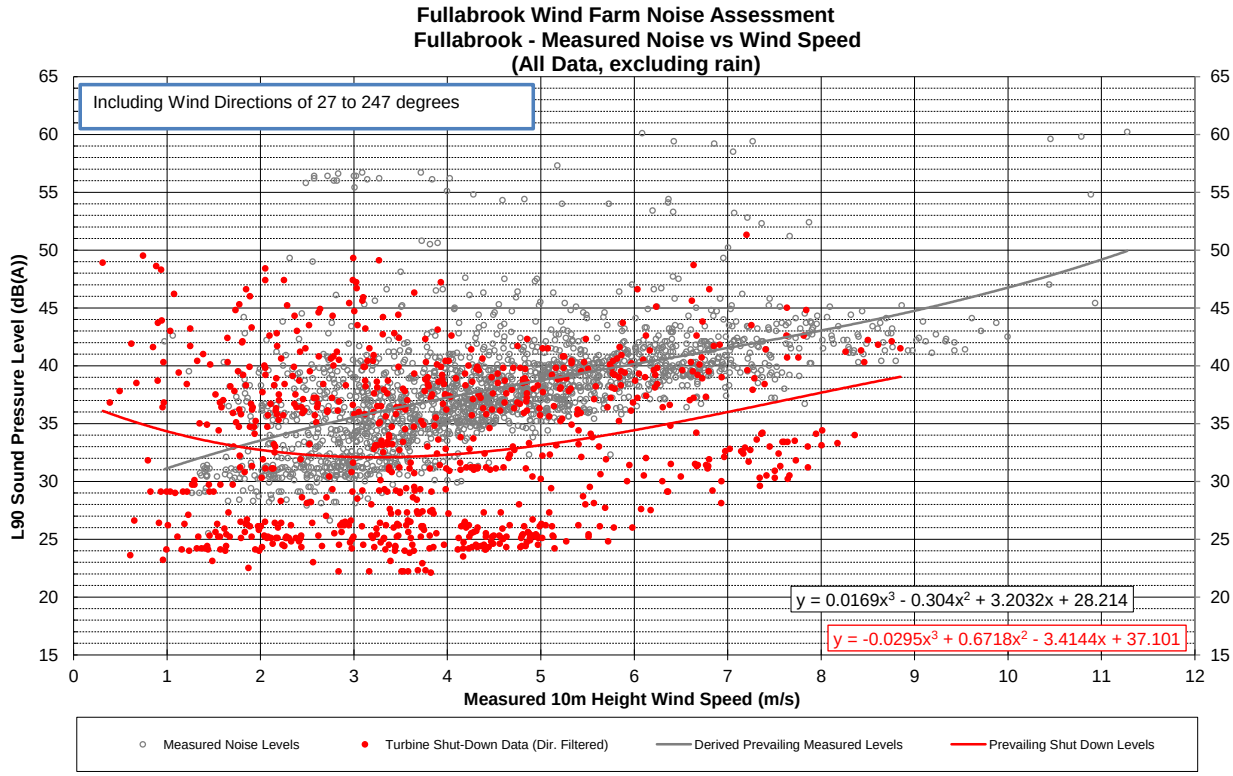


Figure 62 Fullabrook Noise Compliance Assessment Chart 6



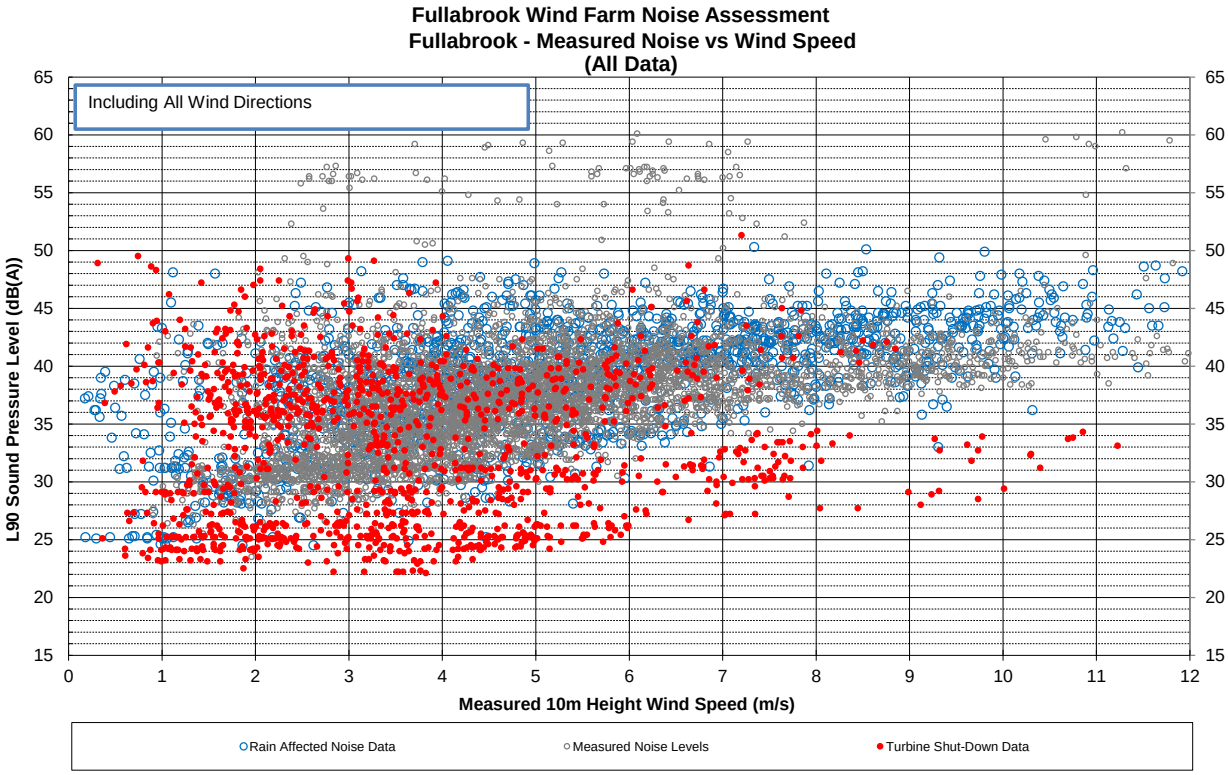

Fullabrook Wind Farm Noise Assessment
Fullabrook - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 64 Halsinger Noise Compliance Assessment Chart 1

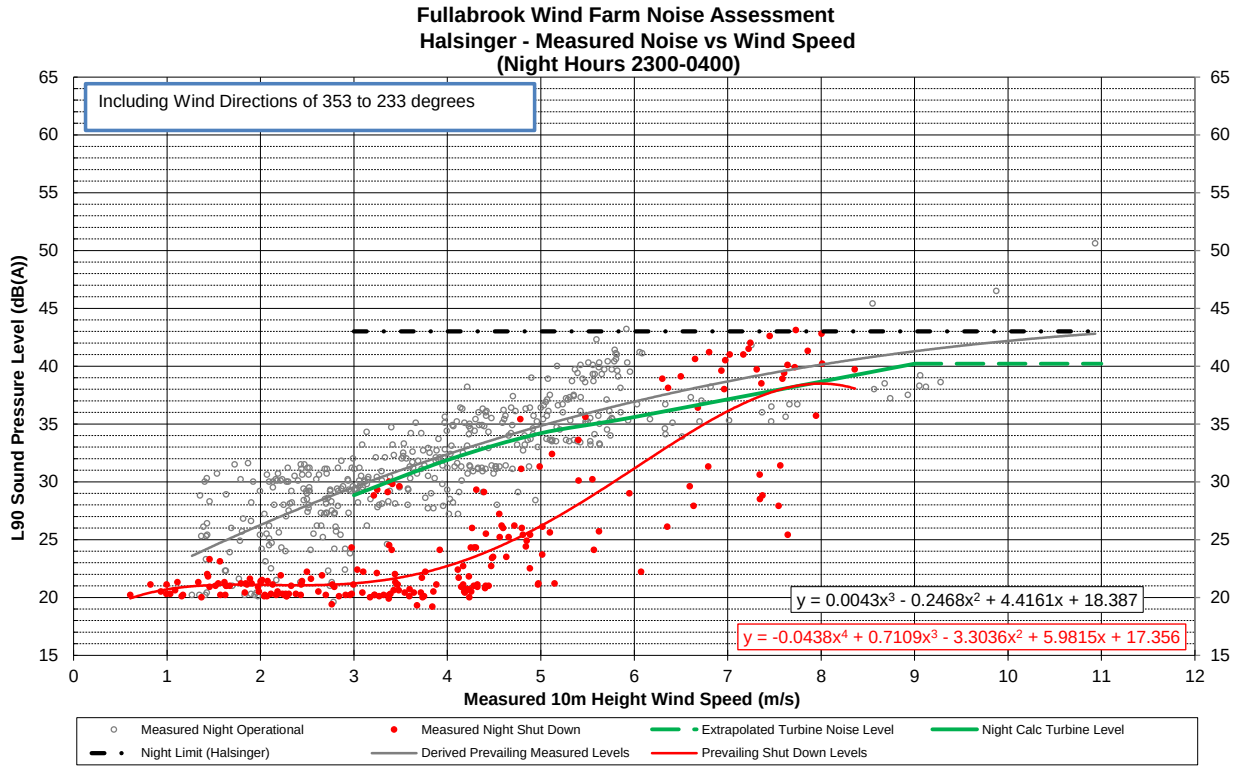


Figure 65 Halsinger Noise Compliance Assessment Chart 2

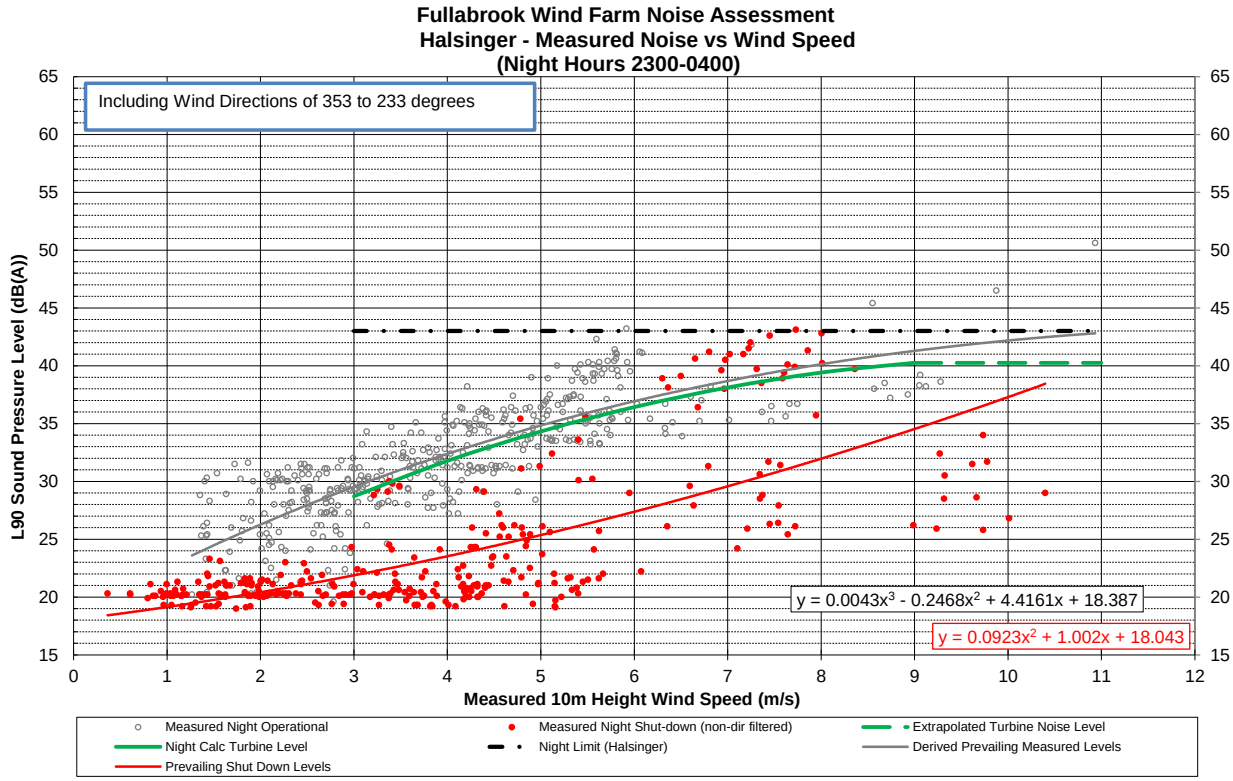


Figure 66 Halsinger Noise Compliance Assessment Chart 3

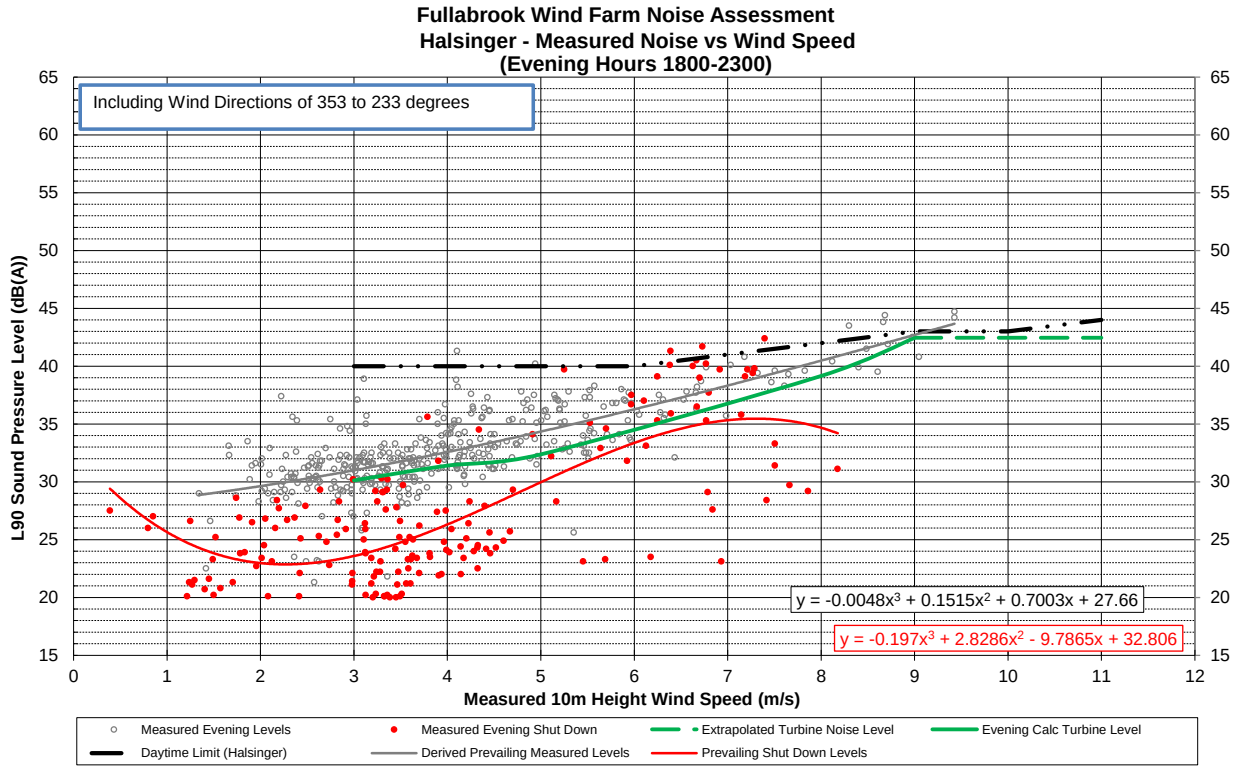


Figure 67 Halsinger Noise Compliance Assessment Chart 4

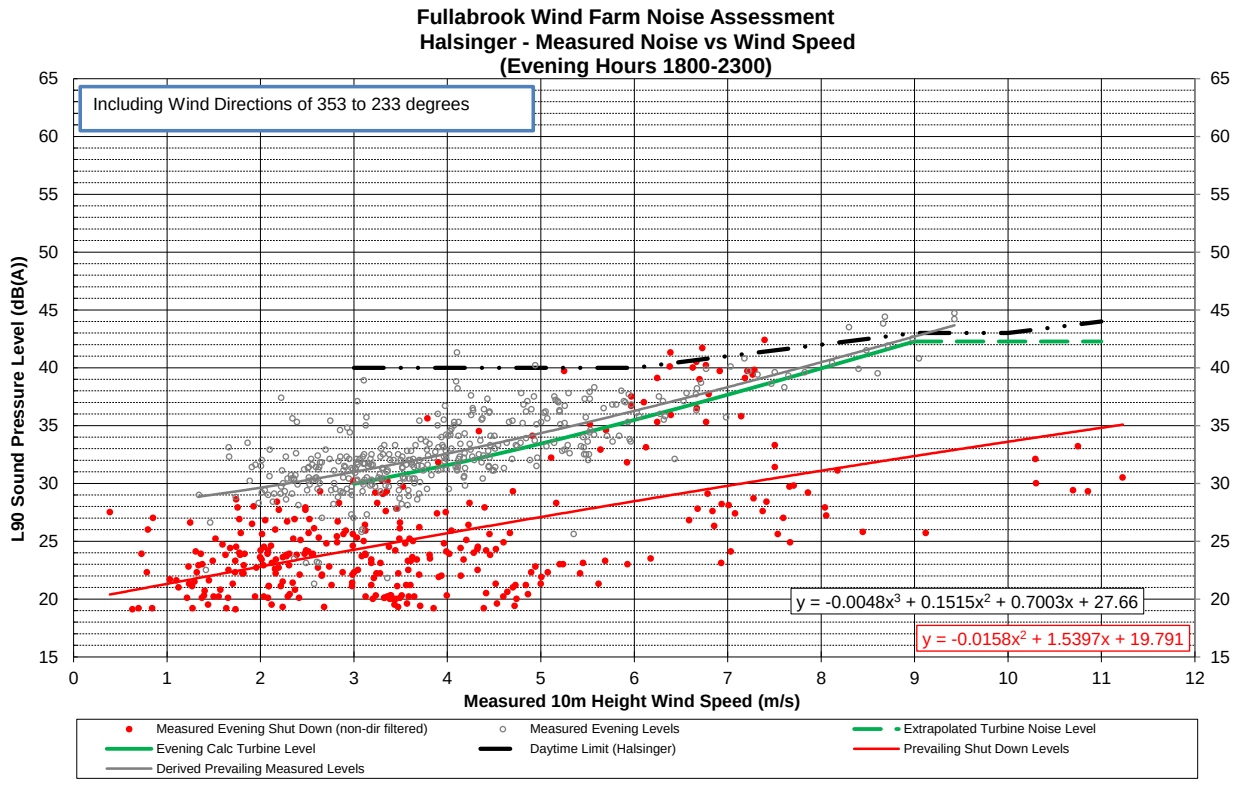


Figure 68 Halsinger Noise Compliance Assessment Chart 5

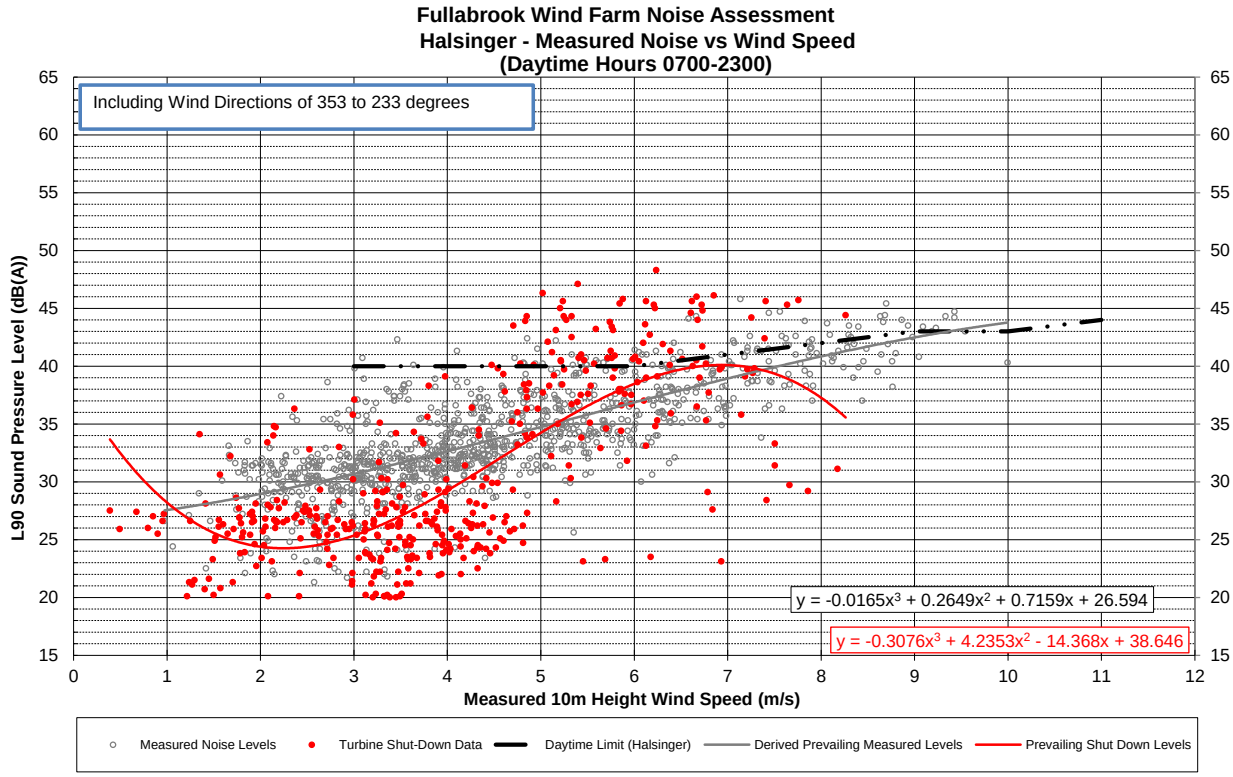


Figure 69 Halsinger Noise Compliance Assessment Chart 6

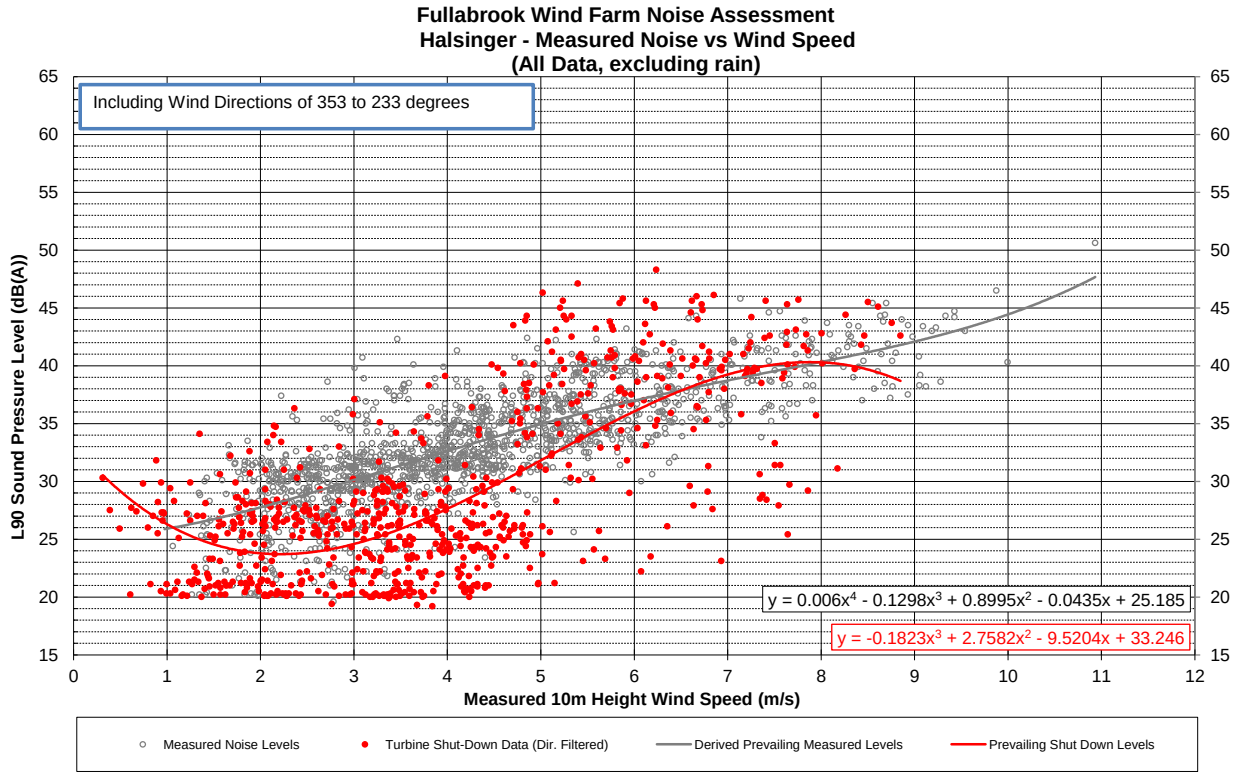


Figure 70 Halsinger Noise Compliance Assessment Chart 7

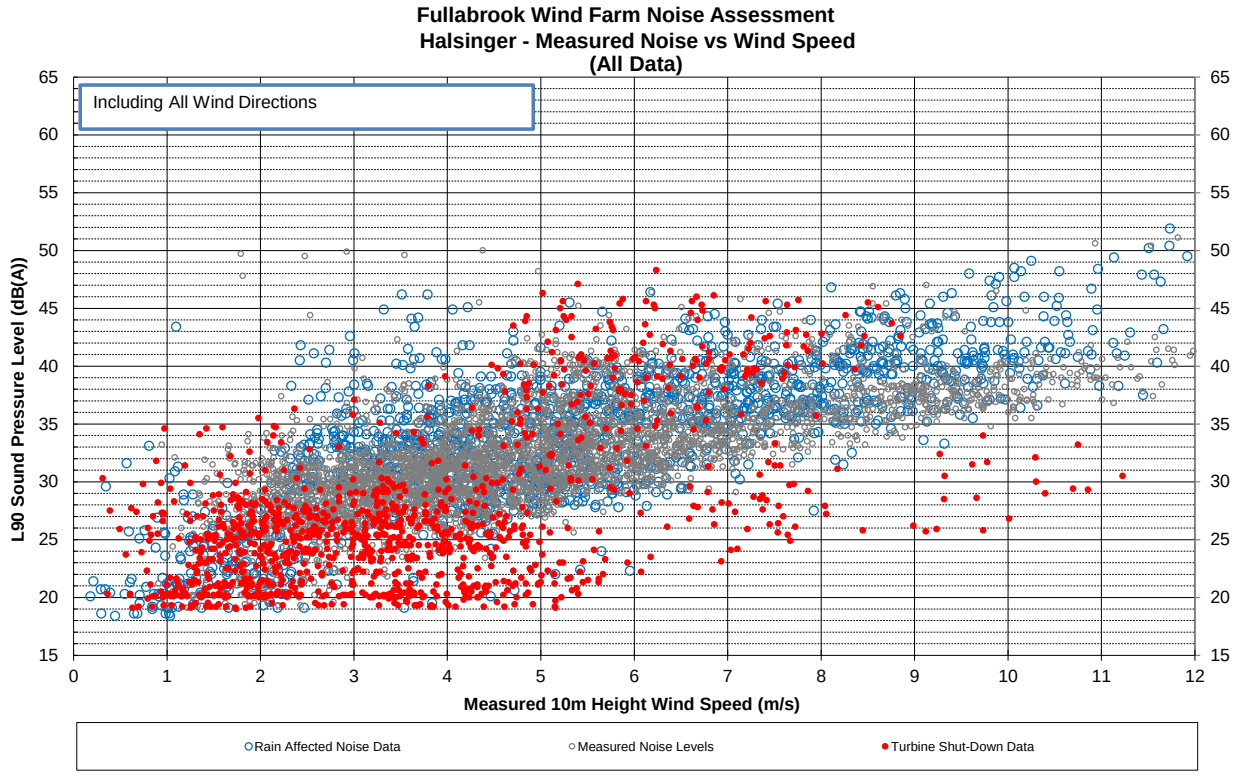


Figure 71 Beara Noise Compliance Assessment Chart 1

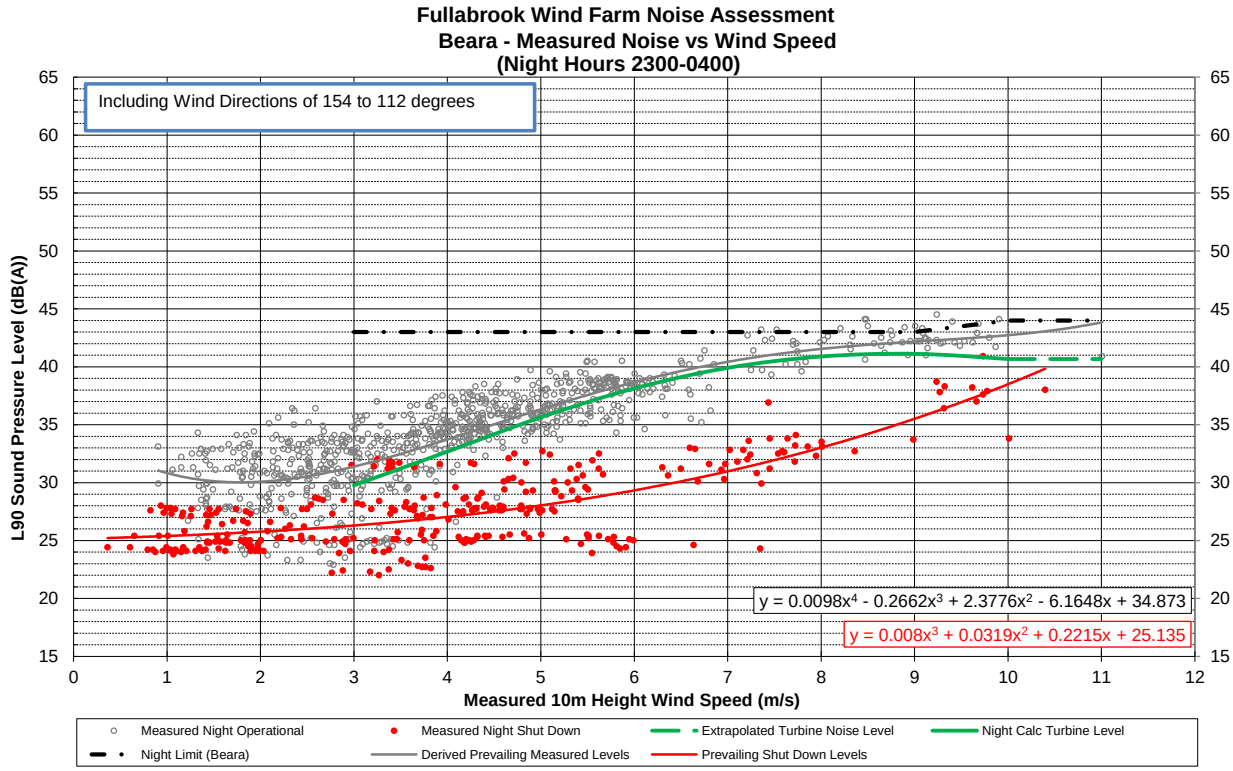


Figure 72 Beara Noise Compliance Assessment Chart 2

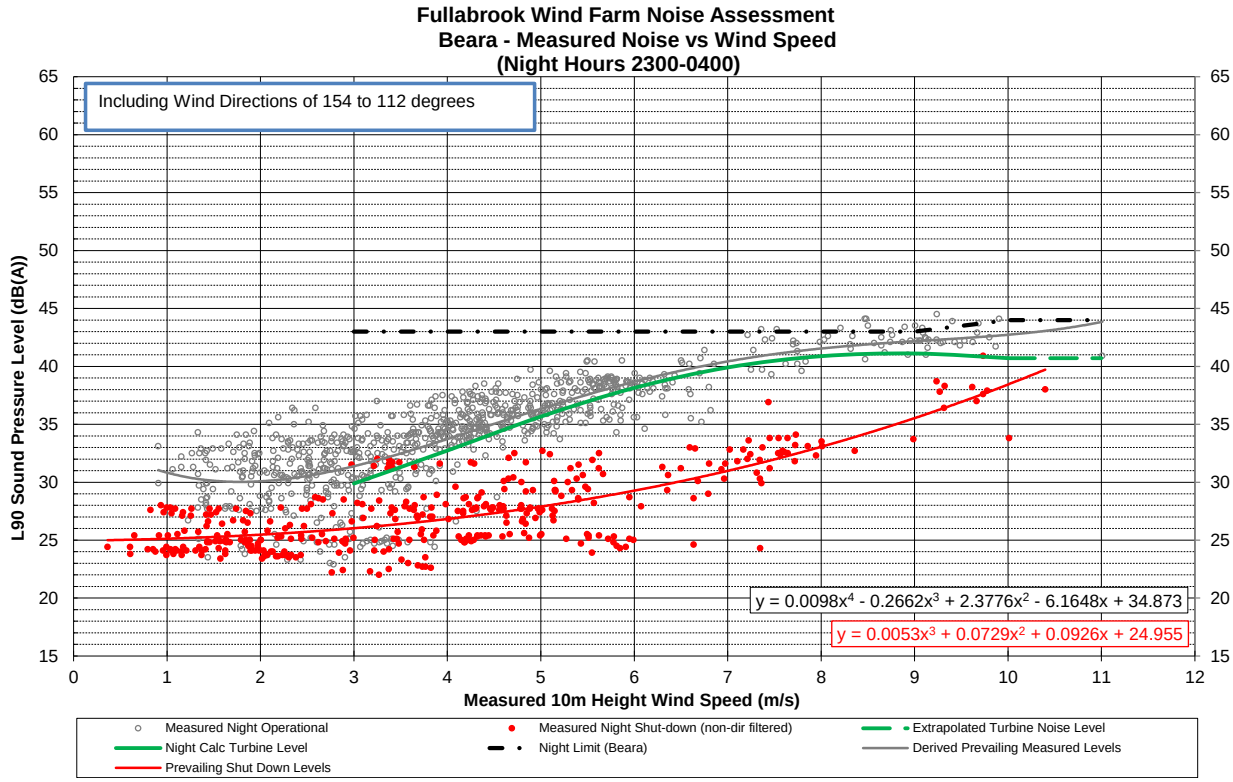


Figure 73 Beara Noise Compliance Assessment Chart 3

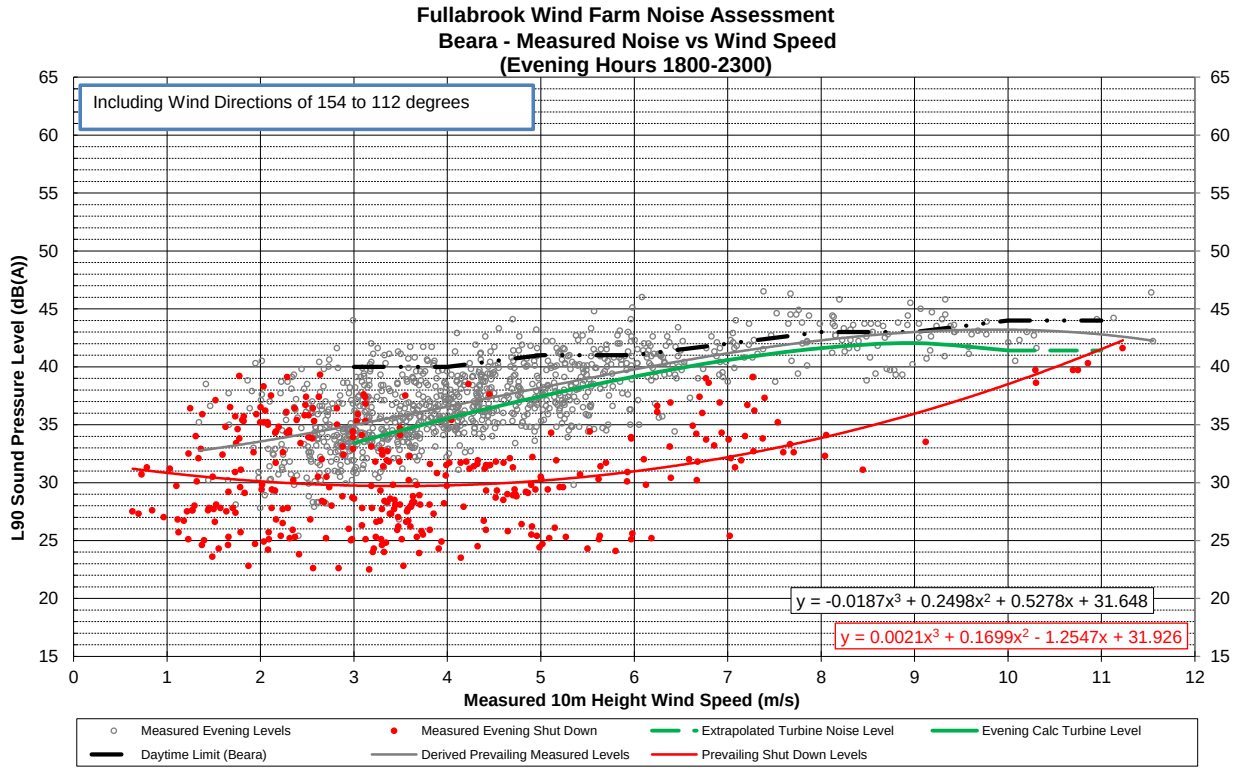


Figure 74 Beara Noise Compliance Assessment Chart 4

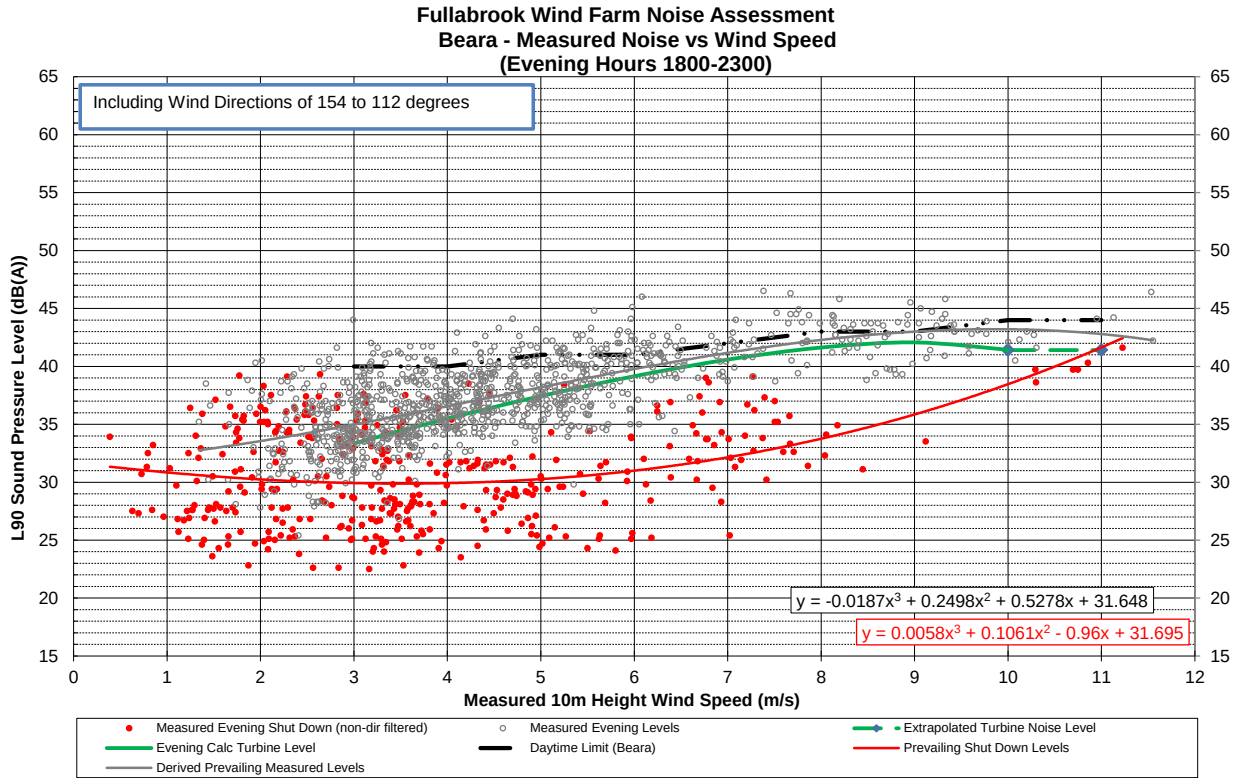


Figure 75 Beara Noise Compliance Assessment Chart 5

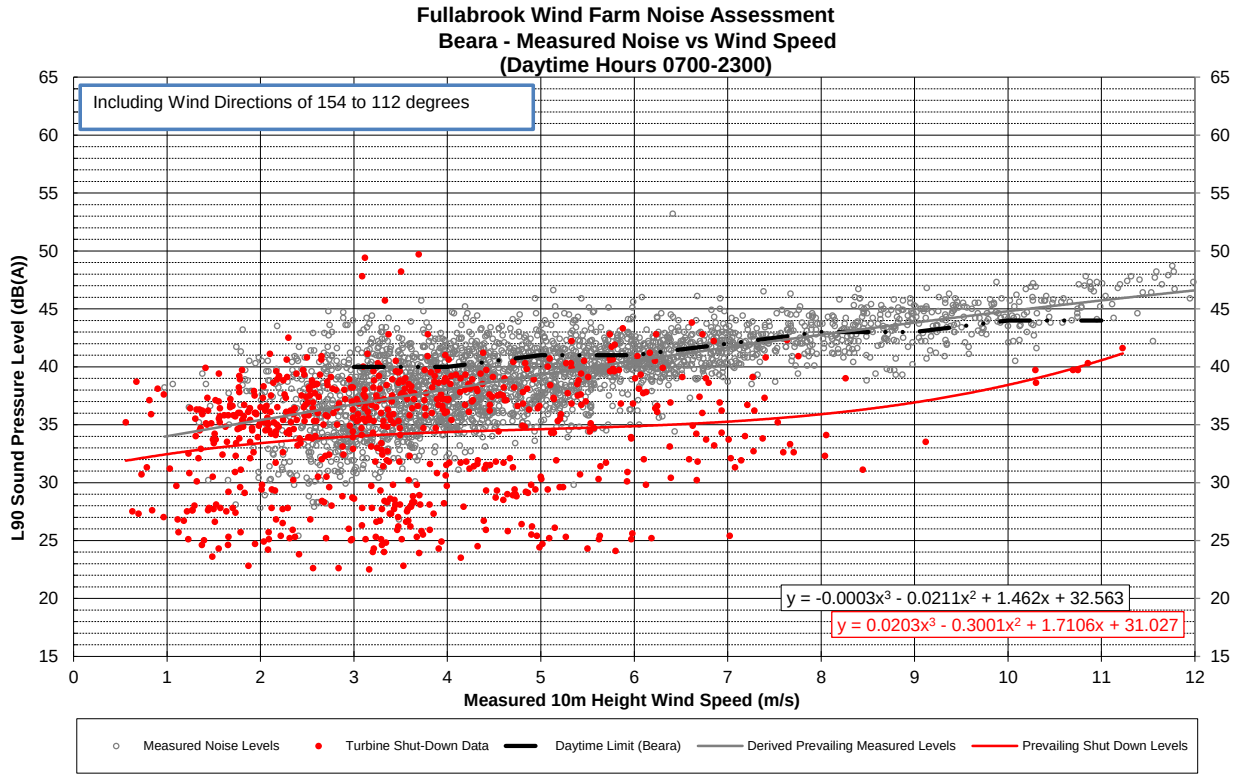
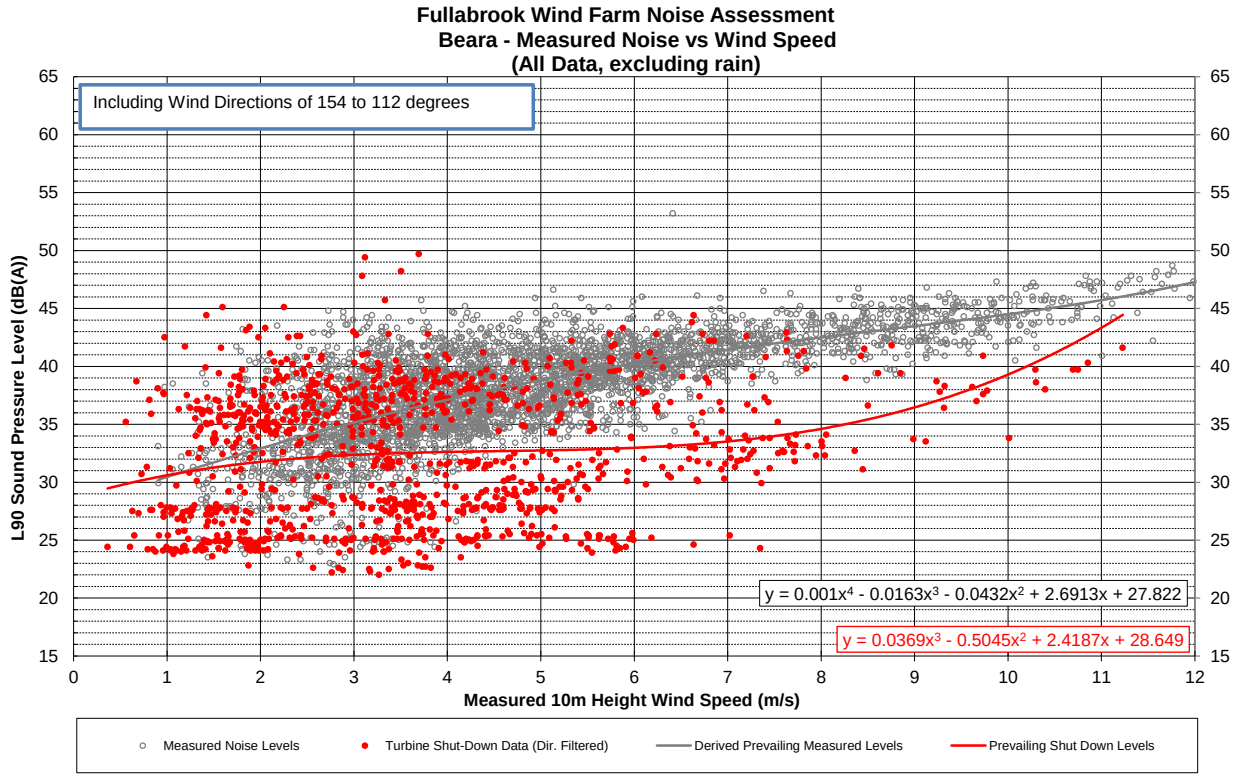


Figure 76 Beara Noise Compliance Assessment Chart 6



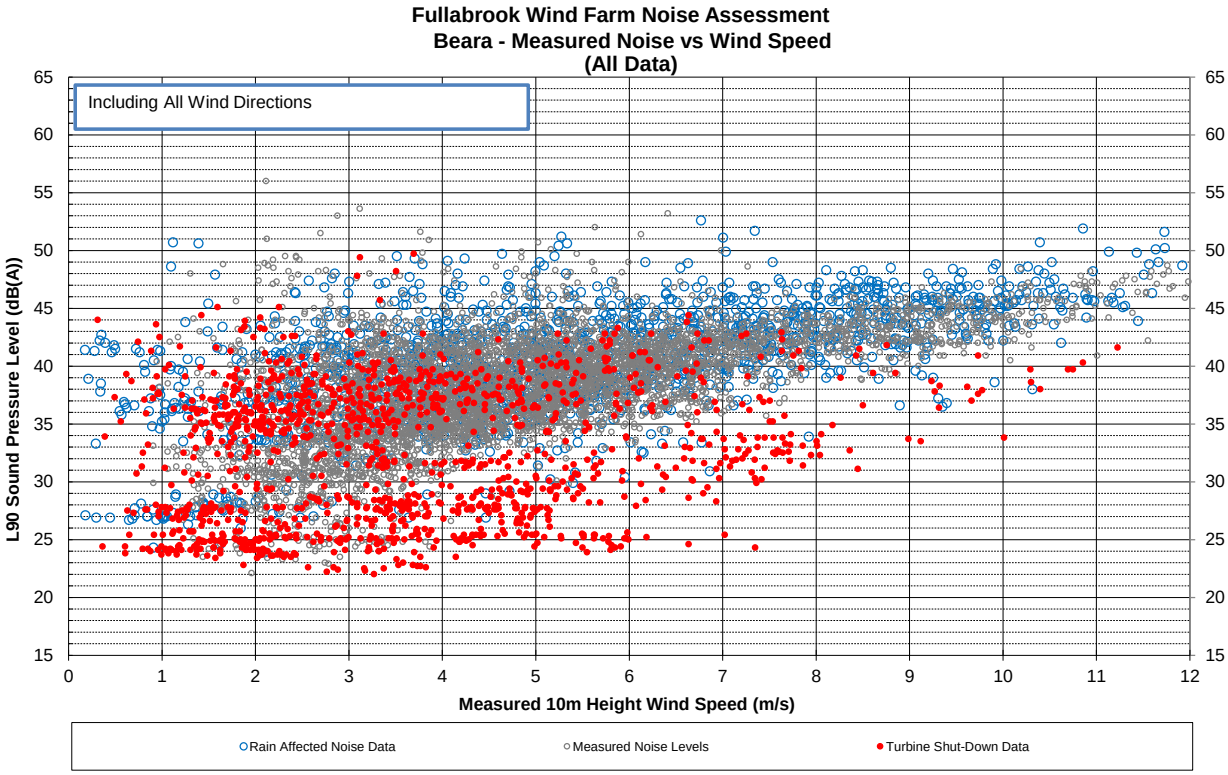

Fullabrook Wind Farm Noise Assessment
Beara - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 78 Pippacott Noise Compliance Assessment Chart 1

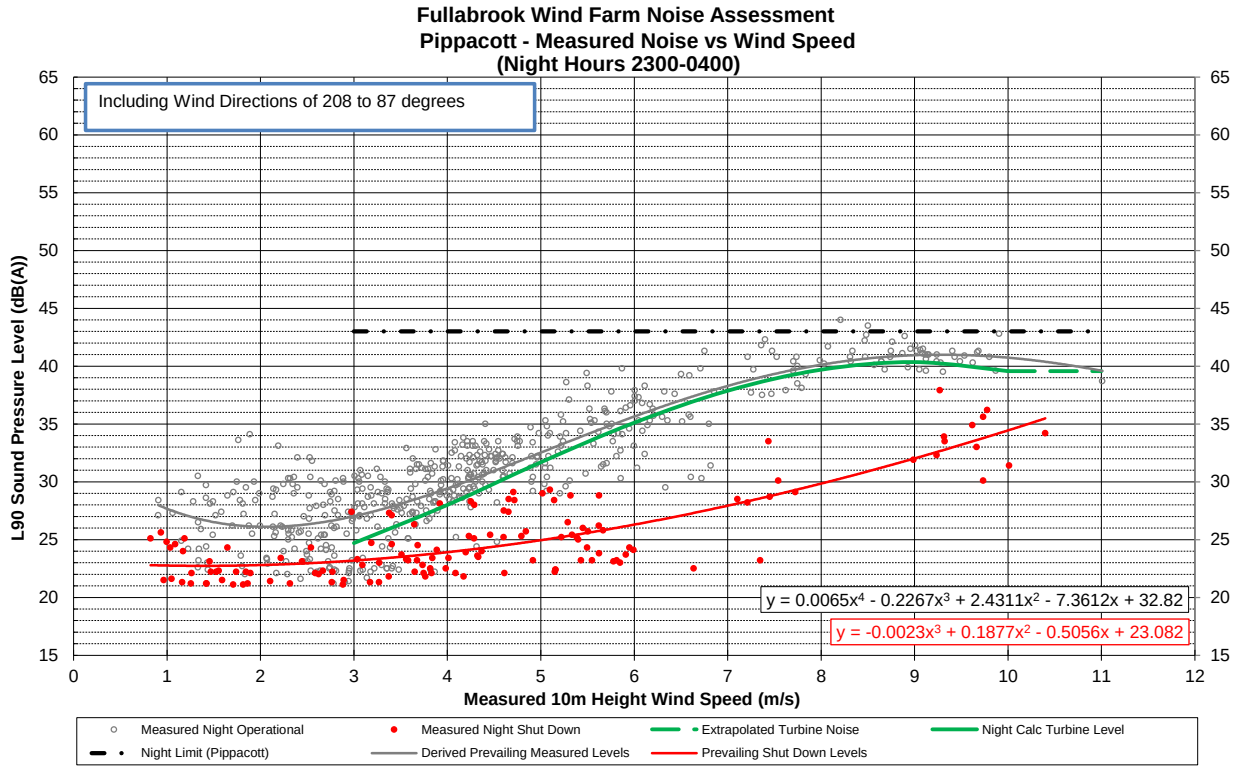


Figure 79 Pippacott Noise Compliance Assessment Chart 2

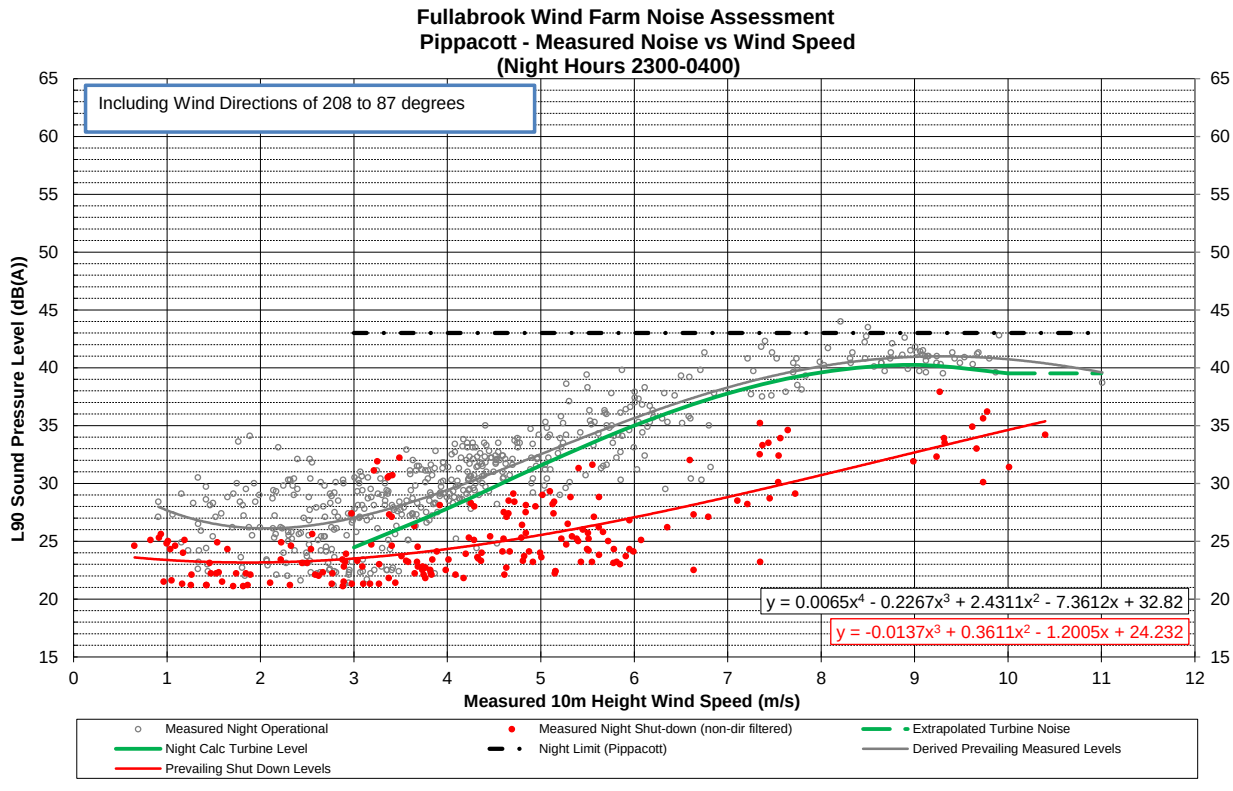


Figure 80 Pippacott Noise Compliance Assessment Chart 3

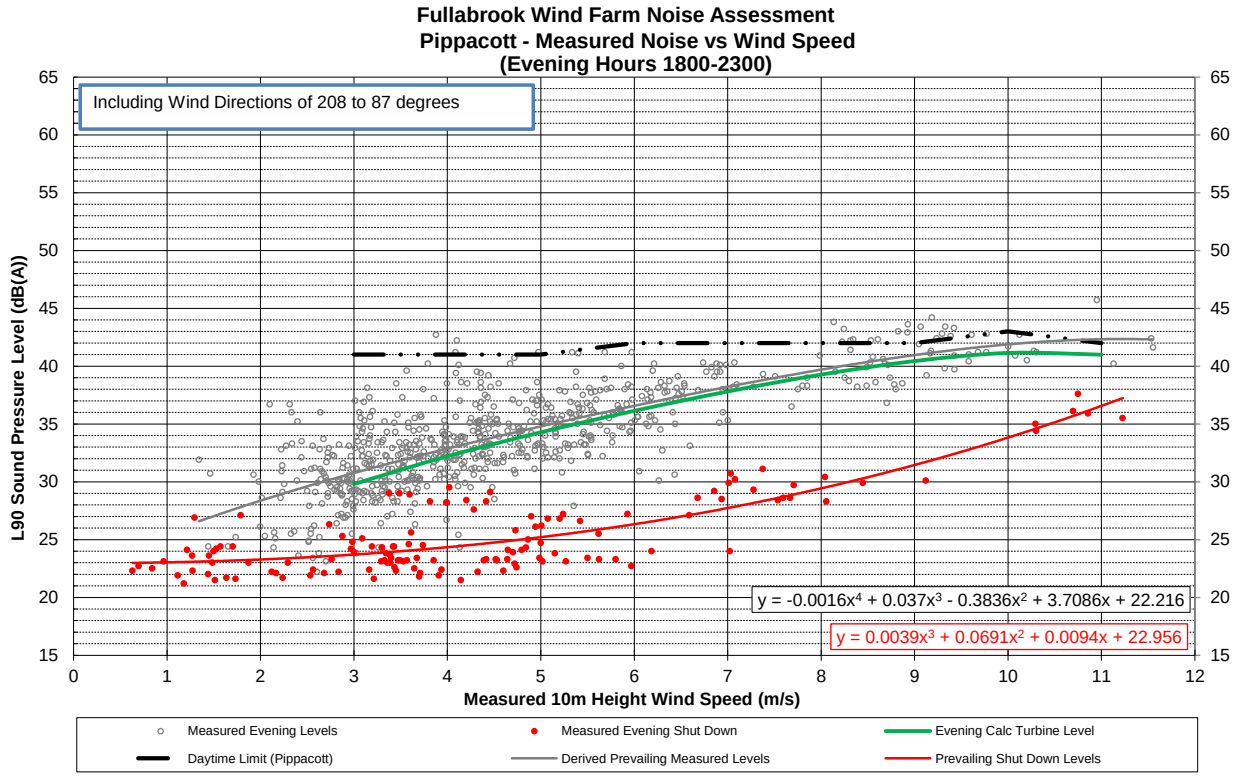


Figure 81 Pippacott Noise Compliance Assessment Chart 4

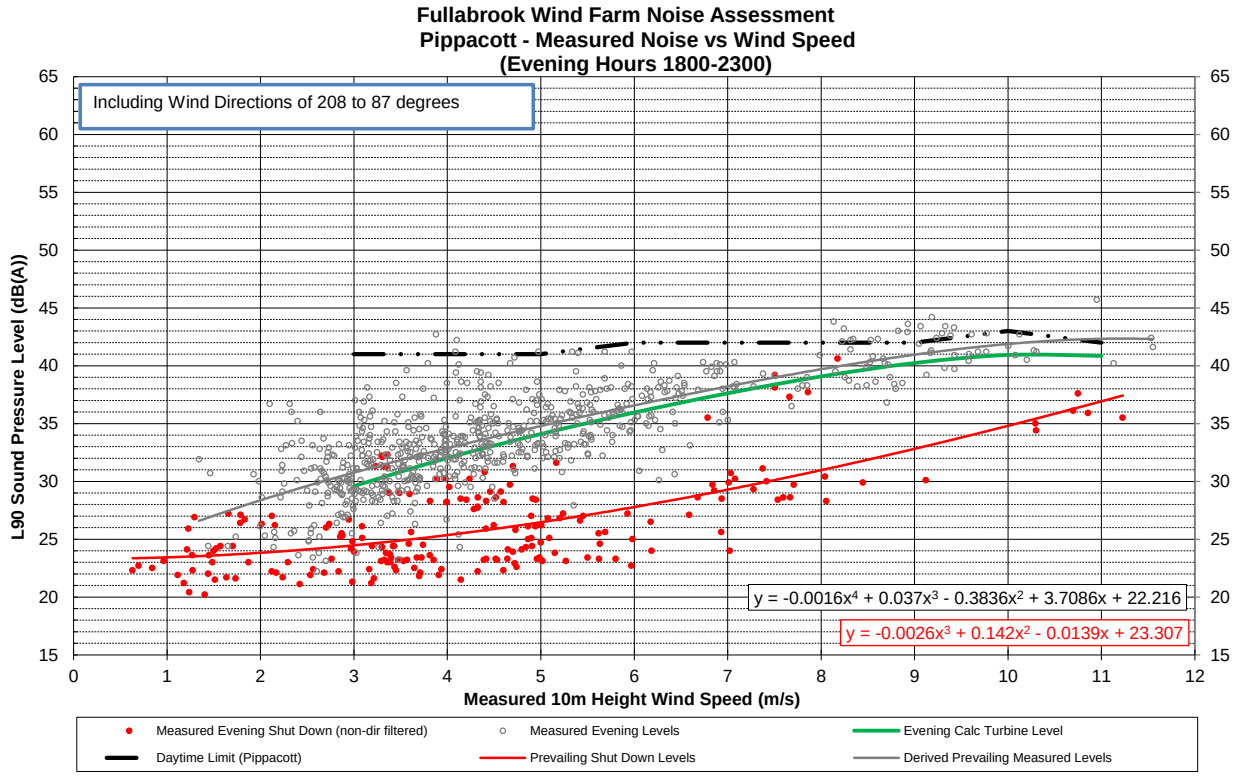


Figure 82 Pippacott Noise Compliance Assessment Chart 5

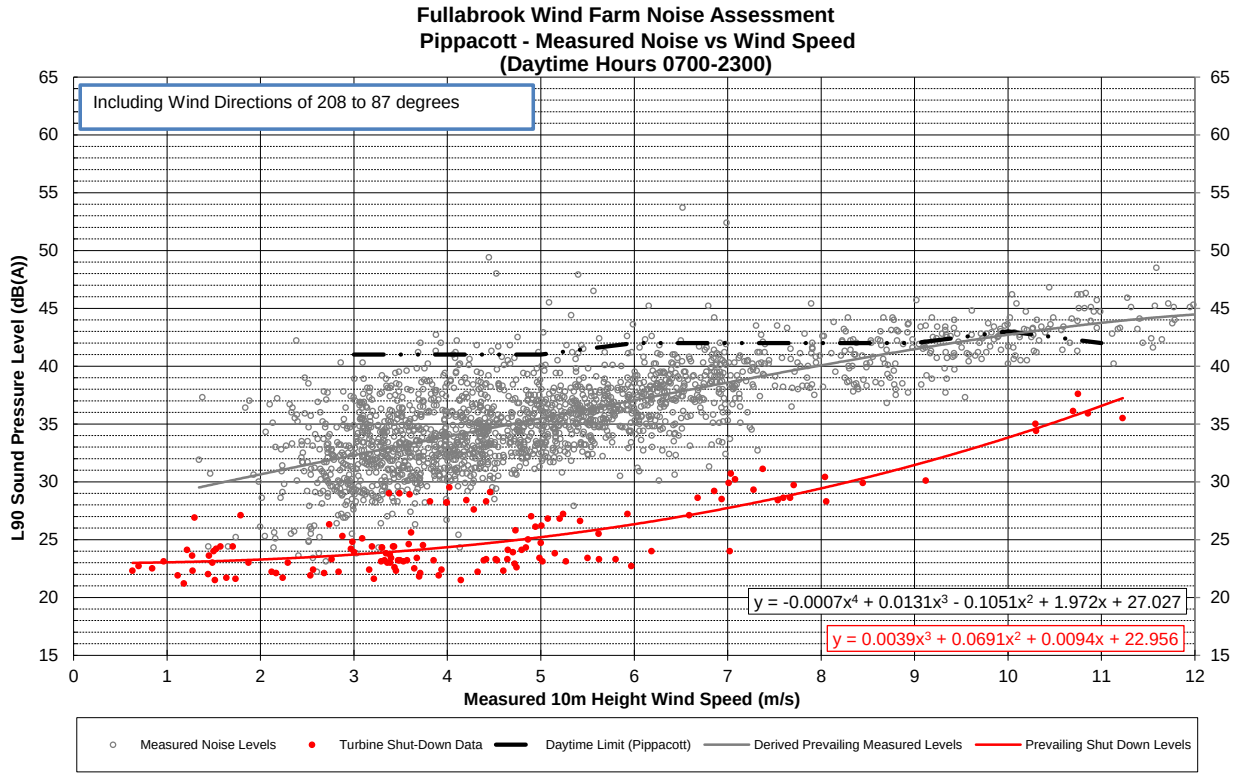
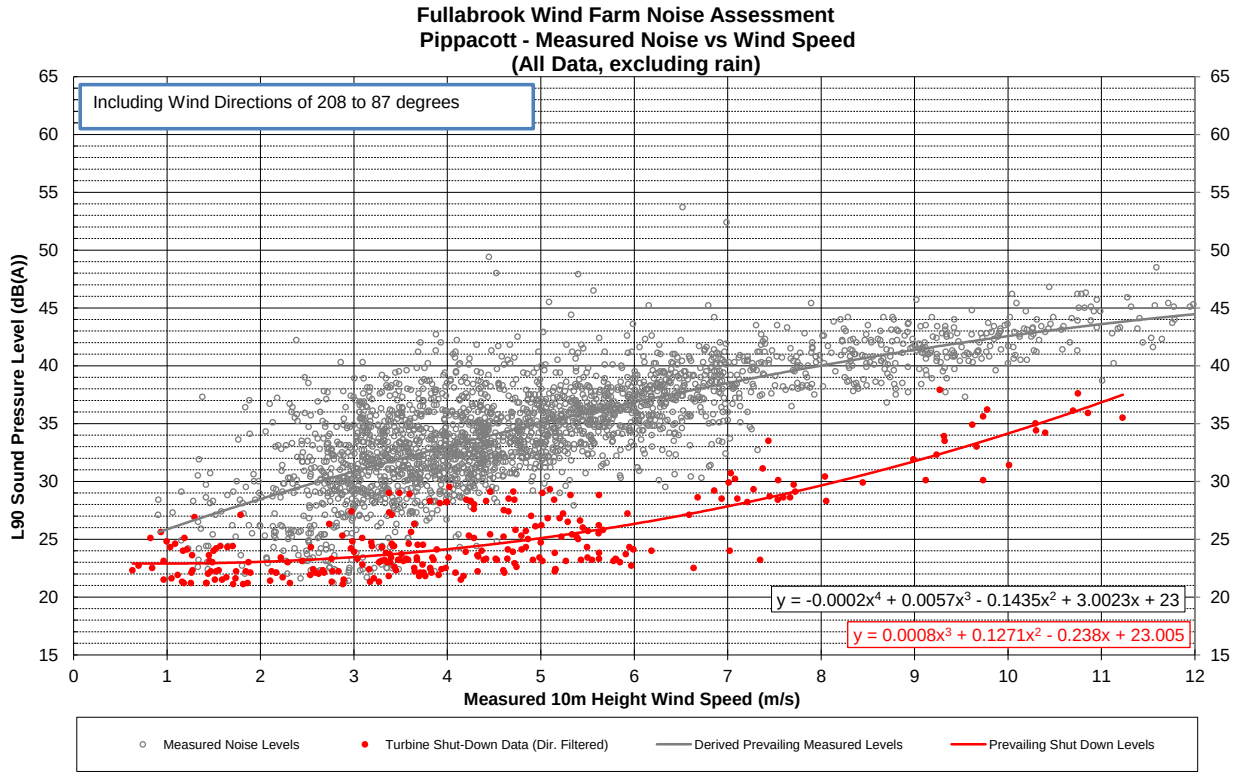


Figure 83 Pippacott Noise Compliance Assessment Chart 6



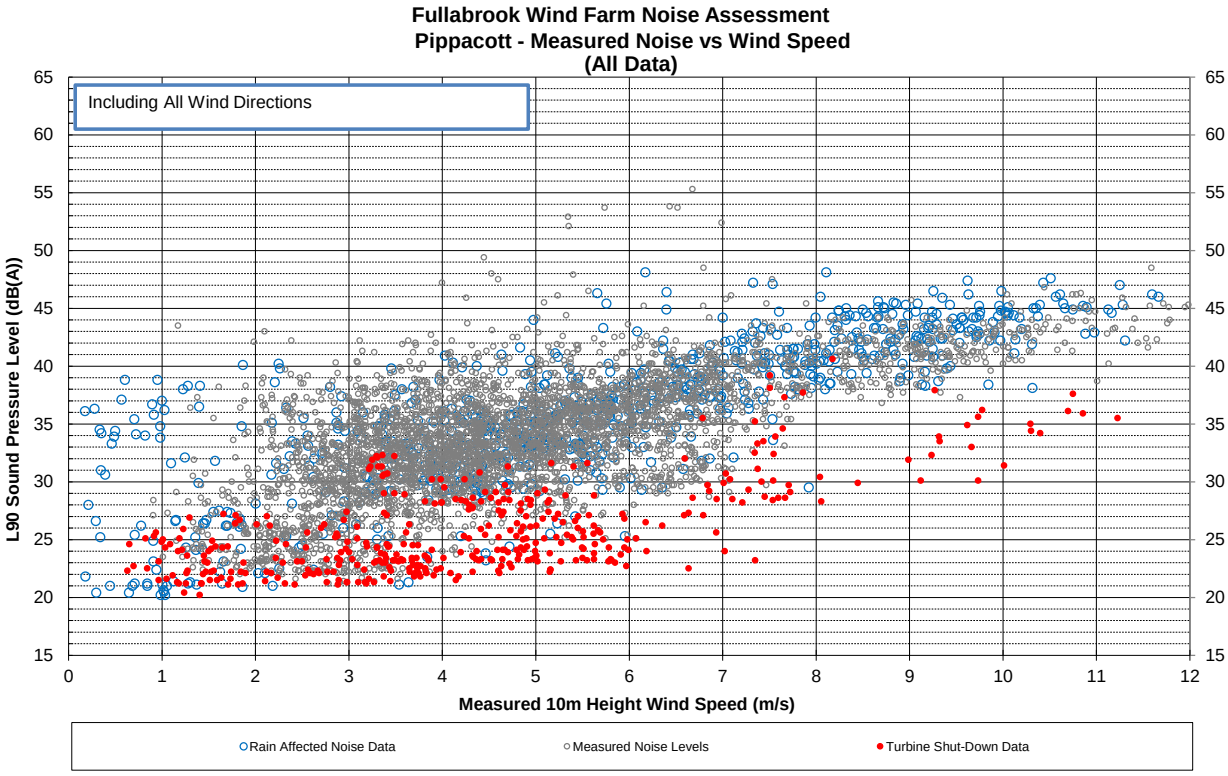

Fullabrook Wind Farm Noise Assessment
Pippacott - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Figure 85 Luscott Noise Compliance Assessment Chart 1

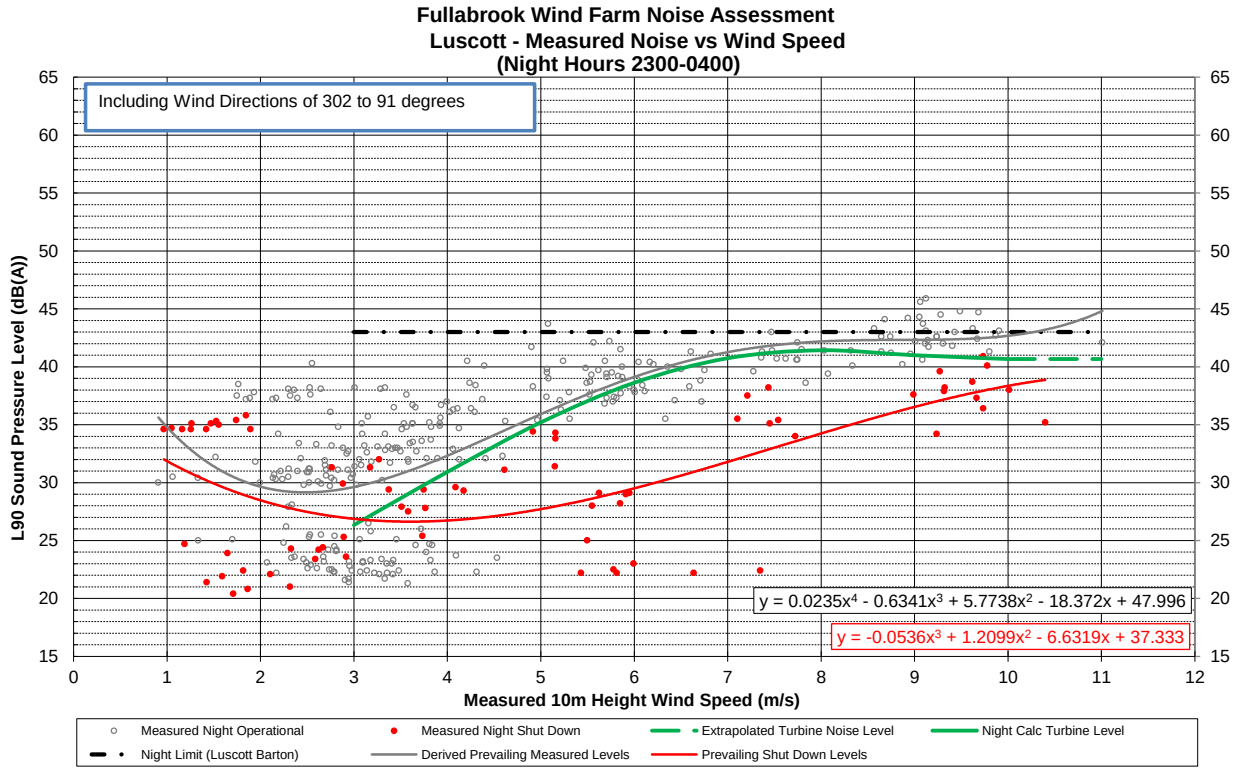


Figure 86 Luscott Noise Compliance Assessment Chart 2

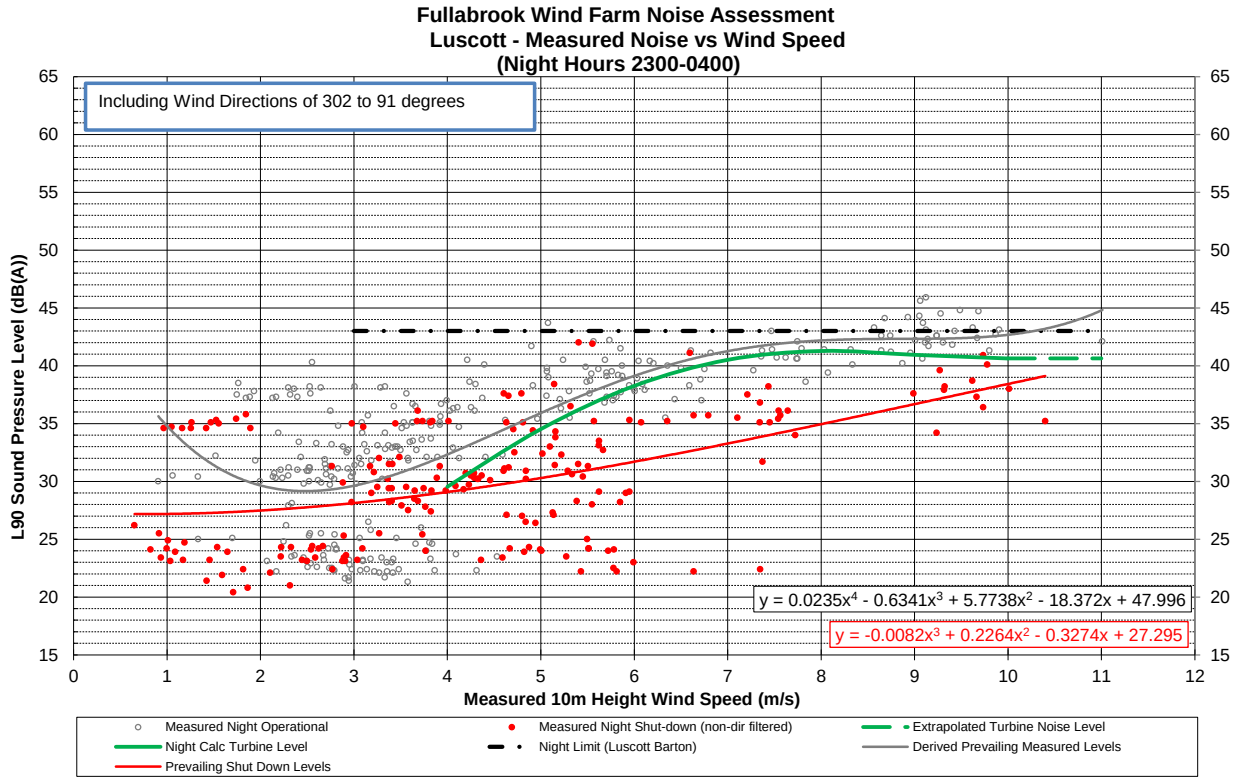


Figure 87 Luscott Noise Compliance Assessment Chart 3

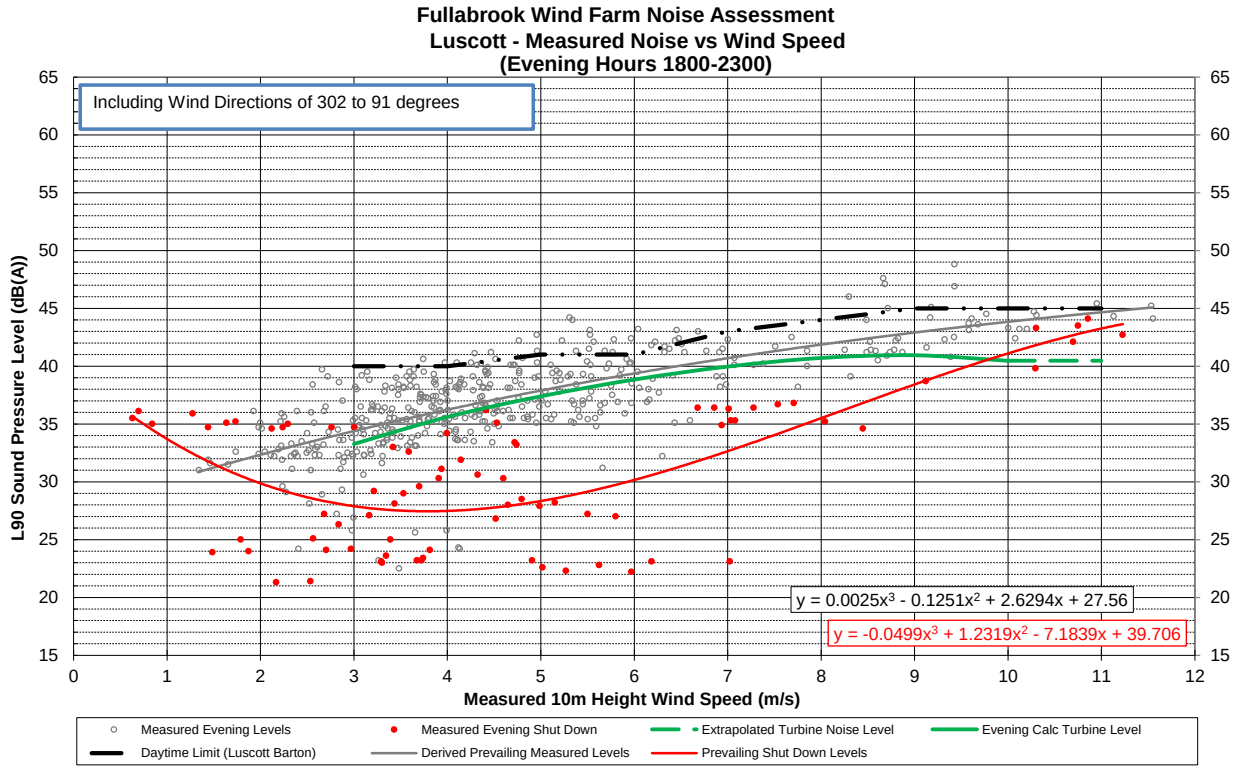


Figure 88 Luscott Noise Compliance Assessment Chart 4

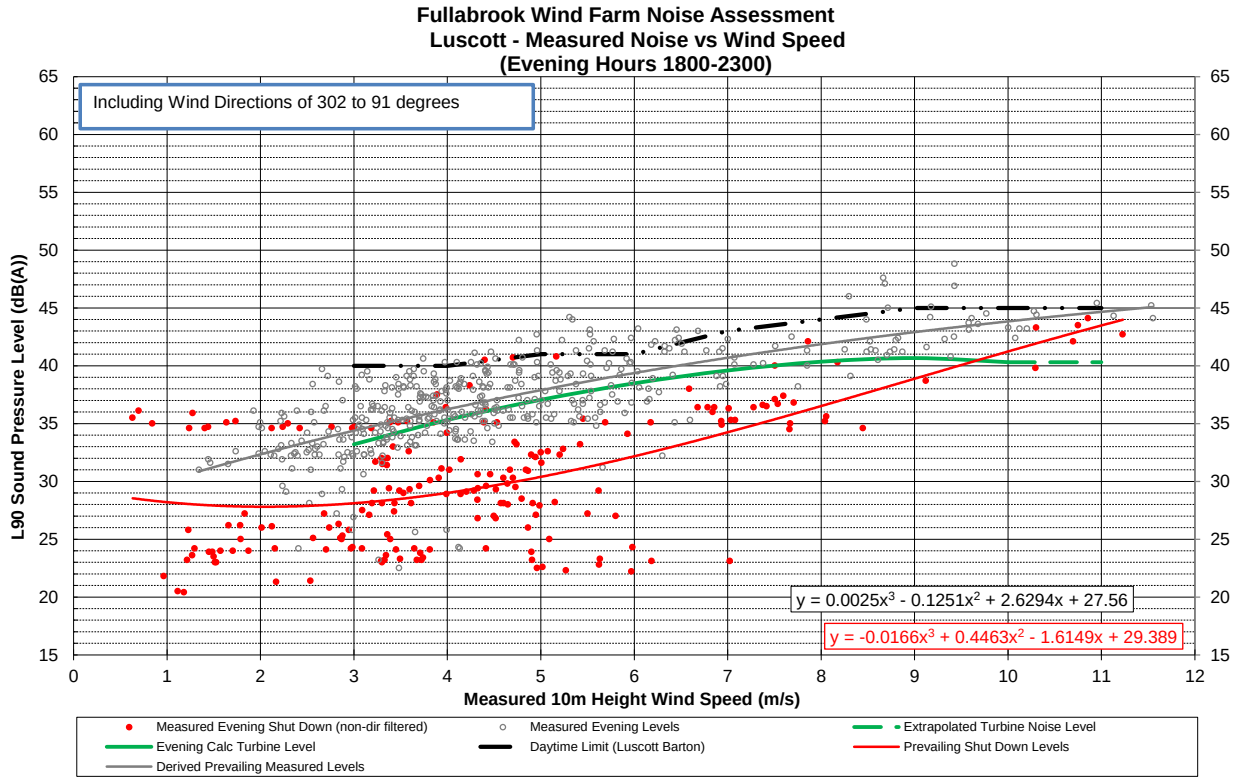


Figure 89 Luscott Noise Compliance Assessment Chart 5

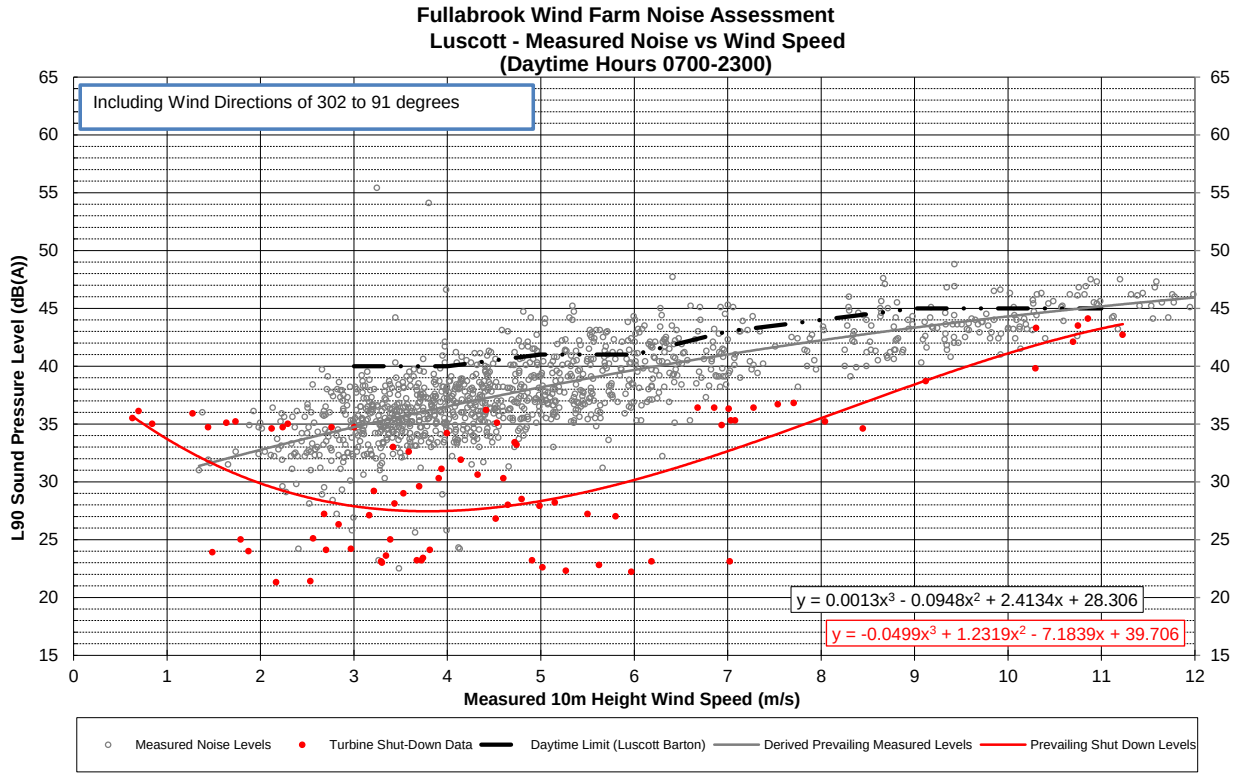
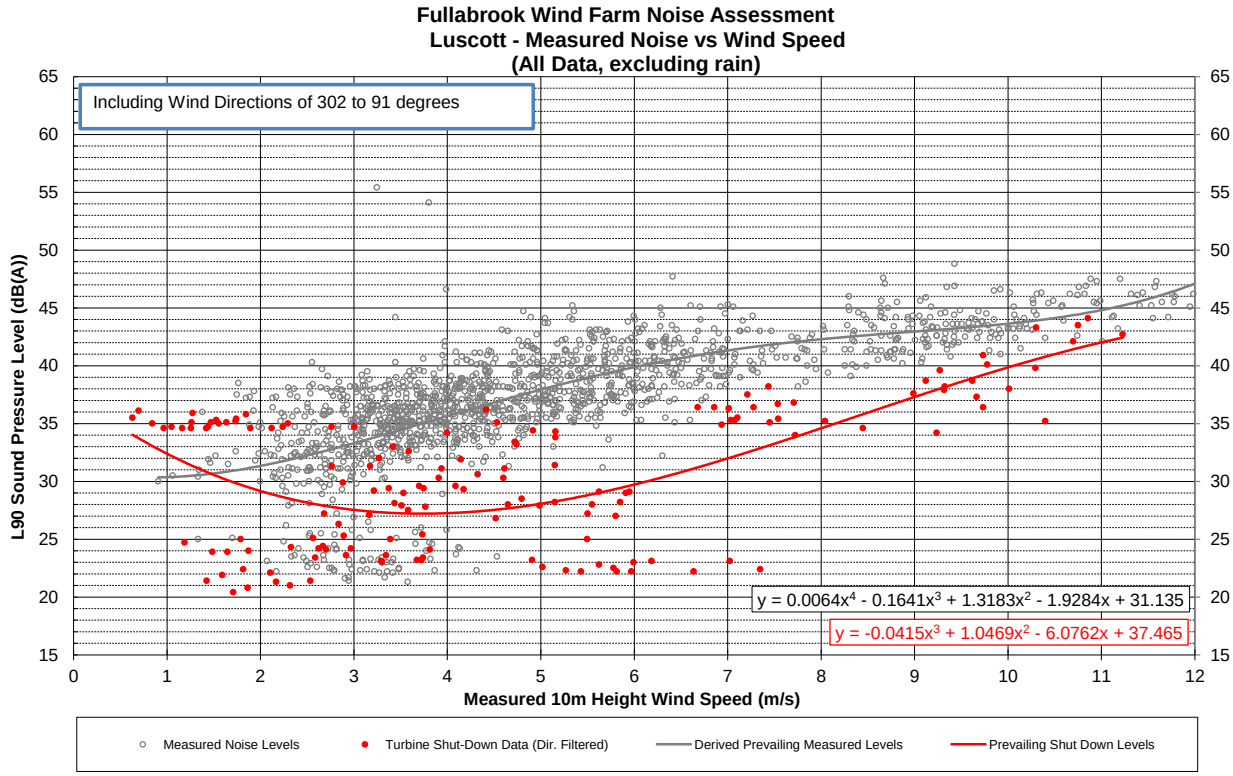
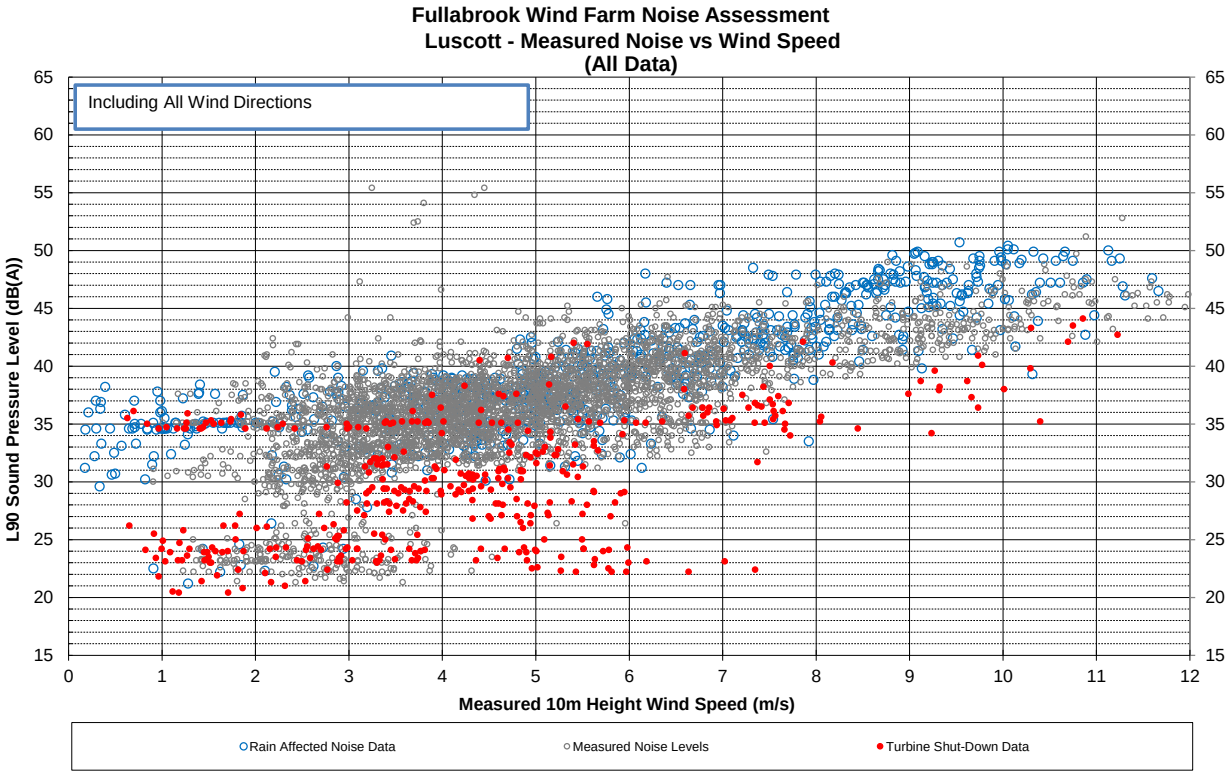


Figure 90 Luscott Noise Compliance Assessment Chart 6




Fullabrook Wind Farm Noise Assessment
Luscott - Measured Noise vs Wind Speed
(All Data)
Including All Wind Directions
L90 Sound Pressure Level (dB(A))
Measured 10m Height Wind Speed (m/s)
Rain Affected Noise Data
Measured Noise Levels
Turbine Shut-Down Data

Appendix D

Noise Assessment and Mitigation Charts

Appendix E

Mitigation Required for Each Turbine

Day

	wind speed at hub height (m/s)											
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	6	6	6	6	6	3	3	3	0	0	0
45	0	6	6	6	6	6	3	3	3	0	0	0
60	0	6	6	6	6	6	3	3	3	0	0	0
75	0	6	6	6	6	6	3	3	3	0	0	0
90	0	6	6	6	6	6	3	3	3	0	0	0
105	0	6	6	6	6	6	3	3	3	0	0	0
120	0	6	6	6	6	6	3	3	3	0	0	0
135	0	6	6	6	6	6	3	3	3	0	0	0
150	0	6	6	6	6	6	3	3	3	0	0	0
165	0	6	6	6	6	6	3	3	3	0	0	0
180	0	6	6	6	6	6	3	3	3	0	0	0
195	0	6	6	6	6	6	3	3	3	0	0	0
210	0	6	6	6	6	6	3	3	3	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0
											0	

Night

	wind speed at hub height (m/s)											
Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day & Night

	wind speed at hub height (m/s)										
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	1	1	1	1	1	1	1	1	0	0	0
15	0	6	6	6	6	6	6	6	6	6	0	0
30	0	6	6	6	6	6	6	6	6	6	0	0
45	0	6	6	6	6	6	6	6	6	6	0	0
60	0	6	6	6	6	6	6	6	6	6	0	0
75	0	6	6	6	6	6	6	6	6	6	0	0
90	0	6	6	6	6	6	6	6	6	6	0	0
105	0	6	6	6	6	6	6	6	6	6	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	1	1	1	1	1	1	1	1	0	0	0

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	6	6	6	3	3	3	0	0	0
75	0	0	0	6	6	6	3	3	3	0	0	0
90	0	0	0	6	6	6	3	3	3	0	0	0
105	0	0	0	6	6	6	3	3	3	0	0	0
120	0	0	0	6	6	6	3	3	3	0	0	0
135	0	0	0	6	6	6	3	3	3	0	0	0
150	0	0	0	6	6	6	3	3	3	0	0	0
165	0	0	0	6	6	6	3	3	3	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day & Night

	wind speed at hub height (m/s)										
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	6	6	6	6	6	6	6	6	6	6	0	0
15	6	6	6	6	6	6	6	6	6	6	0	0
30	6	6	6	6	6	6	6	6	6	6	0	0
45	6	6	6	6	6	6	6	6	6	6	0	0
60	6	6	6	6	6	6	6	6	6	6	0	0
75	6	6	6	6	6	6	6	6	6	6	0	0
90	6	6	6	6	6	6	6	6	6	6	0	0
105	6	6	6	6	6	6	6	6	6	6	0	0
120	6	6	6	6	6	6	6	6	6	6	0	0
135	6	6	6	6	6	6	6	6	6	6	0	0
150	0	3	3	3	3	3	3	3		0	0	0
165	0	3	3	3	3	3	3	3	3	0	0	0
180	6	6	6	6	6	6	6	6	6	6	0	0
195	6	6	6	6	6	6	6	6	6	6	0	0
210	6	6	6	6	6	6	6	6	6	6	0	0
225	6	6	6	6	6	6	6	6	6	6	0	0
240	6	6	6	6	6	6	6	6	6	6	0	0
255	6	6	6	6	6	6	6	6	6	6	0	0
270	6	6	6	6	6	6	6	6	6	6	0	0
285	6	6	6	6	6	6	6	6	6	6	0	0
300	6	6	6	6	6	6	6	6	6	6	0	0
315	6	6	6	6	6	6	6	6	6	6	0	0
330	6	6	6	6	6	6	6	6	6	6	0	0
345	6	6	6	6	6	6	6	6	6	6	0	0
360	6	6	6	6	6	6	6	6	6	6	0	0

Day & Night

	wind speed at hub height (m/s)										
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day & Night

	wind speed at hub height (m/s)										
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	6	6	6	6	6	6	6	6	6	6	0	0
15	6	6	6	6	6	6	6	6	6	6	0	0
30	6	6	6	6	6	6	6	6	6	6	0	0
45	6	6	6	6	6	6	6	6	6	6	0	0
60	6	6	6	6	6	6	6	6	6	6	0	0
75	6	6	6	6	6	6	6	6	6	6	0	0
90	6	6	6	6	6	6	6	6	6	6	0	0
105	6	6	6	6	6	6	6	6	6	6	0	0
120	6	6	6	6	6	6	6	6	6	6	0	0
135	6	6	6	6	6	6	6	6	6	6	0	0
150	3	3	3	3	3	3	3	3		0	0	0
165	3	3	3	3	3	3	3	3		0	0	0
180	6	6	6	6	6	6	6	6	6	6	0	0
195	6	6	6	6	6	6	6	6	6	6	0	0
210	6	6	6	6	6	6	6	6	6	6	0	0
225	6	6	6	6	6	6	6	6	6	6	0	0
240	6	6	6	6	6	6	6	6	6	6	0	0
255	6	6	6	6	6	6	6	6	6	6	0	0
270	6	6	6	6	6	6	6	6	6	6	0	0
285	6	6	6	6	6	6	6	6	6	6	0	0
300	6	6	6	6	6	6	6	6	6	6	0	0
315	6	6	6	6	6	6	6	6	6	6	0	0
330	6	6	6	6	6	6	6	6	6	6	0	0
345	6	6	6	6	6	6	6	6	6	6	0	0
360	6	6	6	6	6	6	6	6	6	6	0	0

Day & Night

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	6	6	6	6	6	6	6	6	6	6	0
15	0	6	6	6	6	6	6	6	6	6	6	0
30	0	6	6	6	6	6	6	6	6	6	6	0
45	0	6	6	6	6	6	6	6	6	6	6	0
60	0	6	6	6	6	6	6	6	6	6	6	0
75	0	6	6	6	6	6	6	6	6	6	6	0
90	0	6	6	6	6	6	6	6	6	6	6	0
105	0	2	2	2	2	2	2	2	2	0	0	0
120	0	2	2	2	2	2	2	2	2	0	0	0
135	0	2	2	2	2	2	2	2	2	0	0	0
150	0	2	2	2	2	2	2	2	2	0	0	0
165	0	2	2	2	2	2	2	2	2	0	0	0
180	0	2	2	2	2	2	2	2	2	0	0	0
195	0	2	2	2	2	2	2	2	2	0	0	0
210	0	2	2	2	2	2	2	2	2	0	0	0
225	0	2	2	2	2	2	2	2	2	0	0	0
240	0	2	2	2	2	2	2	2	2	0	0	0
255	0	6	6	6	6	6	6	6	6	6	6	0
270	0	6	6	6	6	6	6	6	6	6	6	0
285	0	6	6	6	6	6	6	6	6	6	6	0
300	0	6	6	6	6	6	6	6	6	6	6	0
315	0	6	6	6	6	6	6	6	6	6	6	0
330	0	6	6	6	6	6	6	6	6	6	6	0
345	0	6	6	6	6	6	6	6	6	6	6	0
360	0	6	6	6	6	6	6	6	6	6	6	0

Day & Night

	wind speed at hub height (m/s)										
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day

	wind speed at hub height (m/s)											
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	6	6	6	6	6	6	6	6	0	0	0	0
15	6	6	6	6	6	6	6	6	0	0	0	0
30	6	6	6	6	6	6	6	6	0	0	0	0
45	6	6	6	6	6	6	6	6	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	6	6	6	6	6	6	6	6	0	0	0	0
225	6	6	6	6	6	6	6	6	0	0	0	0
240	6	6	6	6	6	6	6	6	0	0	0	0
255	6	6	6	6	6	6	6	6	0	0	0	0
270	6	6	6	6	6	6	6	6	0	0	0	0
285	6	6	6	6	6	6	6	6	0	0	0	0
300	6	6	6	6	6	6	6	6	0	0	0	0
315	6	6	6	6	6	6	6	6	0	0	0	0
330	6	6	6	6	6	6	6	6	0	0	0	0
345	6	6	6	6	6	6	6	6	0	0	0	0
360	6	6	6	6	6	6	6	6	0	0	0	0

Night

	wind speed at hub height (m/s)											
Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day & Night

	wind speed at hub height (m/s)											
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	6	6	6	6	6	3	3	3	3	3	3	3
15	6	6	6	6	6	3	3	3	3	3	3	3
30	6	6	6	6	6	3	3	3	3	3	3	3
45	6	6	6	6	6	3	3	3	3	3	3	3
60	6	6	6	6	6	3	3	3	3	3	3	3
75	6	6	6	6	6	3	3	3	3	3	3	3
90	6	6	6	6	6	3	3	3	3	3	3	3
105	6	6	6	6	6	3	3	3	3	3	3	3
120	6	6	6	6	6	3	3	3	3	3	3	3
135	6	6	6	6	6	3	3	3	3	3	3	3
150	6	6	6	6	6	3	3	3	3	3	3	3
165	6	6	6	6	6	3	3	3	3	3	3	3
180	6	6	6	6	6	3	3	3	3	3	3	3
195	6	6	6	6	6	3	3	3	3	3	3	3
210	6	6	6	6	6	3	3	3	3	3	3	3
225	6	6	6	6	6	3	3	3	3	3	3	3
240	6	6	6	6	6	3	3	3	3	3	3	3
255	6	6	6	6	6	3	3	3	3	3	3	3
270	6	6	6	6	6	3	3	3	3	3	3	3
285	6	6	6	6	6	3	3	3	3	3	3	3
300	6	6	6	6	6	3	3	3	3	3	3	3
315	6	6	6	6	6	3	3	3	3	3	3	3
330	6	6	6	6	6	3	3	3	3	3	3	3
345	6	6	6	6	6	3	3	3	3	3	3	3
360	6	6	6	6	6	3	3	3	3	3	3	3

Day & Night

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5	16.6
0	6	6	6	6	6	6	3	3	3	3	3	3	3
15	6	6	6	6	6	6	3	3	3	3	3	3	3
30	6	6	6	6	6	6	3	3	3	3	3	3	3
45	6	6	6	6	6	6	3	3	3	3	3	3	3
60	6	6	6	6	6	6	3	3	3	3	3	3	3
75	6	6	6	6	6	6	3	3	3	3	3	3	3
90	6	6	6	6	6	6	3	3	3	3	3	3	3
105	6	6	6	6	6	6	3	3	3	3	3	3	3
120	0	0	0	0	0	0	3	3	3	3	3	3	3
135	0	0	0	0	0	0	3	3	3	3	3	3	3
150	6	6	6	6	6	6	3	3	3	3	3	3	3
165	6	6	6	6	6	6	3	3	3	3	3	3	3
180	6	6	6	6	6	6	3	3	3	3	3	3	3
195	6	6	6	6	6	6	3	3	3	3	3	3	3
210	6	6	6	6	6	6	3	3	3	3	3	3	3
225	6	6	6	6	6	6	3	3	3	3	3	3	3
240	6	6	6	6	6	6	3	3	3	3	3	3	3
255	6	6	6	6	6	6	3	3	3	3	3	3	3
270	6	6	6	6	6	6	3	3	3	3	3	3	3
285	6	6	6	6	6	6	3	3	3	3	3	3	3
300	6	6	6	6	6	6	3	3	3	3	3	3	3
315	6	6	6	6	6	6	3	3	3	3	3	3	3
330	6	6	6	6	6	6	3	3	3	3	3	3	3
345	6	6	6	6	6	6	3	3	3	3	3	3	3
360	6	6	6	6	6	6	3	3	3	3	3	3	3

Day

direction	wind speed at hub height (m/s) 8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	6	6	6	6	6	6	6	6	6	6	0	0
15	6	6	6	6	6	6	6	6	6	6	0	0
30	6	6	6	6	6	6	6	6	6	6	0	0
45	6	6	6	6	6	6	6	6	6	6	0	0
60	0	3	3	3	3	3	3	3	3	3	0	0
75	0	3	3	3	3	3	3	3	3	3	0	0
90	0	3	3	3	3	3	3	3	3	3	0	0
105	0	3	3	3	3	3	3	3	3	3	0	0
120	0	3	3	3	3	3	3	3	3	3	0	0
135	0	3	3	3	3	3	3	3	3	3	0	0
150	0	3	3	3	3	3	3	3	3	3	0	0
165	0	3	3	3	3	3	3	3	3	3	0	0
180	0	3	3	3	3	3	3	3	3	3	0	0
195	0	3	3	3	3	3	3	3	3	3	0	0
210	6	6	6	6	6	6	6	6	6	6	0	0
225	6	6	6	6	6	6	6	6	6	6	0	0
240	6	6	6	6	6	6	6	6	6	6	0	0
255	6	6	6	6	6	6	6	6	6	6	0	0
270	6	6	6	6	6	6	6	6	6	6	0	0
285	6	6	6	6	6	6	6	6	6	6	0	0
300	6	6	6	6	6	6	6	6	6	6	0	0
315	6	6	6	6	6	6	6	6	6	6	0	0
330	6	6	6	6	6	6	6	6	6	6	0	0
345	6	6	6	6	6	6	6	6	6	6	0	0
360	6	6	6	6	6	6	6	6	6	6	0	0

Night

Direction	wind speed at hub height (m/s) 8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day & Night

	wind speed at hub height (m/s)												
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5	16.6
0	6	6	6	6	6	6	3	3	3	3	3	3	3
15	6	6	6	6	6	6	3	3	3	3	3	3	3
30	6	6	6	6	6	6	3	3	3	3	3	3	3
45	6	6	6	6	6	6	3	3	3	3	3	3	3
60	6	6	6	6	6	6	3	3	3	3	3	3	3
75	6	6	6	6	6	6	3	3	3	3	3	3	3
90	6	6	6	6	6	6	3	3	3	3	3	3	3
105	6	6	6	6	6	6	3	3	3	3	3	3	3
120	0	0	0	0	0	0	3	3	3	3	3	3	3
135	0	0	0	0	0	0	3	3	3	3	3	3	3
150	6	6	6	6	6	6	3	3	3	3	3	3	3
165	6	6	6	6	6	6	3	3	3	3	3	3	3
180	6	6	6	6	6	6	3	3	3	3	3	3	3
195	6	6	6	6	6	6	3	3	3	3	3	3	3
210	6	6	6	6	6	6	3	3	3	3	3	3	3
225	6	6	6	6	6	6	3	3	3	3	3	3	3
240	6	6	6	6	6	6	3	3	3	3	3	3	3
255	6	6	6	6	6	6	3	3	3	3	3	3	3
270	6	6	6	6	6	6	3	3	3	3	3	3	3
285	6	6	6	6	6	6	3	3	3	3	3	3	3
300	6	6	6	6	6	6	3	3	3	3	3	3	3
315	6	6	6	6	6	6	3	3	3	3	3	3	3
330	6	6	6	6	6	6	3	3	3	3	3	3	3
345	6	6	6	6	6	6	3	3	3	3	3	3	3
360	6	6	6	6	6	6	3	3	3	3	3	3	3

Day

direction	wind speed at hub height (m/s)											
	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	6	6	6	6	6	6	6	0	0	0	0	0
15	6	6	6	6	6	6	6	0	0	0	0	0
30	6	6	6	6	6	6	6	0	0	0	0	0
45	6	6	6	6	6	6	6	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	3	3	3	0	0	0	0	0
105	0	0	0	0	3	3	3	0	0	0	0	0
120	0	0	0	0	3	3	3	0	0	0	0	0
135	0	0	0	0	3	3	3	0	0	0	0	0
150	0	0	0	0	3	3	3	0	0	0	0	0
165	0	0	0	0	3	3	3	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	6	6	6	6	6	6	6	0	0	0	0	0
255	6	6	6	6	6	6	6	0	0	0	0	0
270	6	6	6	6	6	6	6	0	0	0	0	0
285	6	6	6	6	6	6	6	0	0	0	0	0
300	6	6	6	6	6	6	6	0	0	0	0	0
315	6	6	6	6	6	6	6	0	0	0	0	0
330	6	6	6	6	6	6	6	0	0	0	0	0
345	6	6	6	6	6	6	6	0	0	0	0	0
360	6	6	6	6	6	6	6	0	0	0	0	0

Night

Direction	wind speed at hub height (m/s)											
	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day

	wind speed at hub height (m/s)										
direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	3	3	3	3	3	3	3	3	3	0	0
60	0	3	3	3	3	3	3	3	3	3	0	0
75	0	3	3	3	3	3	3	3	3	3	0	0
90	0	3	3	3	3	3	3	3	3	3	0	0
105	0	3	3	3	3	3	3	3	3	3	0	0
120	0	3	3	3	3	3	3	3	3	3	0	0
135	0	3	3	3	3	3	3	3	3	3	0	0
150	0	3	3	3	3	3	3	3	3	3	0	0
165	0	3	3	3	3	3	3	3	3	3	0	0
180	0	3	3	3	3	3	3	3	3	3	0	0
195	0	3	3	3	3	3	3	3	3	3	0	0
210	0	3	3	3	3	3	3	3	3	3	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Night

	wind speed at hub height (m/s)										
Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5	16.1
0	0	0	3	3	3	3	3	3	3	3	3	3	3
15	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	3	3	3	3	3	3	3	3	3	3	3
120	0	0	3	3	3	3	3	3	3	3	3	3	3
135	0	0	3	3	3	3	3	3	3	3	3	3	3
150	0	0	3	3	3	3	3	3	3	3	3	3	3
165	0	0	3	3	3	3	3	3	3	3	3	3	3
180	0	0	3	3	3	3	3	3	3	3	3	3	3
195	0	0	3	3	3	3	3	3	3	3	3	3	3
210	0	0	3	3	3	3	3	3	3	3	3	3	3
225	0	0	3	3	3	3	3	3	3	3	3	3	3
240	0	0	3	3	3	3	3	3	3	3	3	3	3
255	0	0	3	3	3	3	3	3	3	3	3	3	3
270	0	0	3	3	3	3	3	3	3	3	3	3	3
285	0	0	3	3	3	3	3	3	3	3	3	3	3
300	0	0	3	3	3	3	3	3	3	3	3	3	3
315	0	0	3	3	3	3	3	3	3	3	3	3	3
330	0	0	3	3	3	3	3	3	3	3	3	3	3
345	0	0	3	3	3	3	3	3	3	3	3	3	3
360	0	0	3	3	3	3	3	3	3	3	3	3	3

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8	16.6
0	0	0	3	3	3	3	3	3	3	3	3	3	3
15	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	3	3	3	3	3	3	3	3	3	3	3
120	0	0	3	3	3	3	3	3	3	3	3	3	3
135	0	0	3	3	3	3	3	3	3	3	3	3	3
150	0	0	3	3	3	3	3	3	3	3	3	3	3
165	0	0	3	3	3	3	3	3	3	3	3	3	3
180	0	0	3	3	3	3	3	3	3	3	3	3	3
195	0	0	3	3	3	3	3	3	3	3	3	3	3
210	0	0	3	3	3	3	3	3	3	3	3	3	3
225	0	0	3	3	3	3	3	3	3	3	3	3	3
240	0	0	3	3	3	3	3	3	3	3	3	3	3
255	0	0	3	3	3	3	3	3	3	3	3	3	3
270	0	0	3	3	3	3	3	3	3	3	3	3	3
285	0	0	3	3	3	3	3	3	3	3	3	3	3
300	0	0	3	3	3	3	3	3	3	3	3	3	3
315	0	0	3	3	3	3	3	3	3	3	3	3	3
330	0	0	3	3	3	3	3	3	3	3	3	3	3
345	0	0	3	3	3	3	3	3	3	3	3	3	3
360	0	0	3	3	3	3	3	3	3	3	3	3	3

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5	16.1
0	0	0	3	3	3	3	3	3	3	3	3	3	3
15	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	3	3	3	3	3	3	3	3	3	3	3	3
105	0	3	3	3	3	3	3	3	3	3	3	3	3
120	0	3	3	3	3	3	3	3	3	3	3	3	3
135	0	3	3	3	3	3	3	3	3	3	3	3	3
150	0	3	3	3	3	3	3	3	3	3	3	3	3
165	0	3	3	3	3	3	3	3	3	3	3	3	3
180	0	3	3	3	3	3	3	3	3	3	3	3	3
195	0	3	3	3	3	3	3	3	3	3	3	3	3
210	0	3	3	3	3	3	3	3	3	3	3	3	3
225	0	3	3	3	3	3	3	3	3	3	3	3	3
240	0	3	3	3	3	3	3	3	3	3	3	3	3
255	0	3	3	3	3	3	3	3	3	3	3	3	3
270	0	3	3	3	3	3	3	3	3	3	3	3	3
285	0	3	3	3	3	3	3	3	3	3	3	3	3
300	0	0	3	3	3	3	3	3	3	3	3	3	3
315	0	0	3	3	3	3	3	3	3	3	3	3	3
330	0	0	3	3	3	3	3	3	3	3	3	3	3
345	0	0	3	3	3	3	3	3	3	3	3	3	3
360	0	0	3	3	3	3	3	3	3	3	3	3	3

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8	16.6
0	0	0	3	3	3	3	3	3	3	3	3	3	3
15	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	3	3	3	3	3	3	3	3	3	3	3	3
105	0	3	3	3	3	3	3	3	3	3	3	3	3
120	0	3	3	3	3	3	3	3	3	3	3	3	3
135	0	3	3	3	3	3	3	3	3	3	3	3	3
150	0	3	3	3	3	3	3	3	3	3	3	3	3
165	0	3	3	3	3	3	3	3	3	3	3	3	3
180	0	3	3	3	3	3	3	3	3	3	3	3	3
195	0	3	3	3	3	3	3	3	3	3	3	3	3
210	0	3	3	3	3	3	3	3	3	3	3	3	3
225	0	3	3	3	3	3	3	3	3	3	3	3	3
240	0	3	3	3	3	3	3	3	3	3	3	3	3
255	0	3	3	3	3	3	3	3	3	3	3	3	3
270	0	3	3	3	3	3	3	3	3	3	3	3	3
285	0	3	3	3	3	3	3	3	3	3	3	3	3
300	0	0	3	3	3	3	3	3	3	3	3	3	3
315	0	0	3	3	3	3	3	3	3	3	3	3	3
330	0	0	3	3	3	3	3	3	3	3	3	3	3
345	0	0	3	3	3	3	3	3	3	3	3	3	3
360	0	0	3	3	3	3	3	3	3	3	3	3	3

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5	16.1
0	0	0	6	6	6	6	3	3	3	3	3	3	3
15	0	0	6	6	6	6	3	3	3	3	3	3	3
30	0	0	6	6	6	6	3	3	3	3	3	3	3
45	0	0	6	6	6	6	3	3	3	3	3	3	3
60	0	0	6	6	6	6	3	3	3	3	3	3	3
75	0	0	6	6	6	6	3	3	3	3	3	3	3
90	0	0	6	6	6	6	3	3	3	3	3	3	3
105	0	0	6	6	6	6	3	3	3	3	3	3	3
120	0	0	6	6	6	6	3	3	3	3	3	3	3
135	0	0	6	6	6	6	3	3	3	3	3	3	3
150	0	0	6	6	6	6	3	3	3	3	3	3	3
165	0	0	6	6	6	6	3	3	3	3	3	3	3
180	0	0	6	6	6	6	3	3	3	3	3	3	3
195	0	0	6	6	6	6	3	3	3	3	3	3	3
210	0	0	6	6	6	6	3	3	3	3	3	3	3
225	0	0	6	6	6	6	3	3	3	3	3	3	3
240	0	0	6	6	6	6	3	3	3	3	3	3	3
255	0	0	6	6	6	6	3	3	3	3	3	3	3
270	0	0	6	6	6	6	3	3	3	3	3	3	3
285	0	0	6	6	6	6	3	3	3	3	3	3	3
300	0	0	6	6	6	6	3	3	3	3	3	3	3
315	0	0	6	6	6	6	3	3	3	3	3	3	3
330	0	0	6	6	6	6	3	3	3	3	3	3	3
345	0	0	6	6	6	6	3	3	3	3	3	3	3
360	0	0	6	6	6	6	3	3	3	3	3	3	3

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8	16.6
0	0	0	3	3	3	3	3	3	3	3	3	3	3
15	0	0	0	0	0	0	3	3	3	3	3	3	3
30	0	0	0	0	0	0	3	3	3	3	3	3	3
45	0	0	0	0	0	0	3	3	3	3	3	3	3
60	0	0	0	0	0	0	3	3	3	3	3	3	3
75	0	0	0	0	0	0	3	3	3	3	3	3	3
90	0	0	0	0	0	0	3	3	3	3	3	3	3
105	0	0	3	3	3	3	3	3	3	3	3	3	3
120	0	0	3	3	3	3	3	3	3	3	3	3	3
135	0	0	3	3	3	3	3	3	3	3	3	3	3
150	0	0	3	3	3	3	3	3	3	3	3	3	3
165	0	0	3	3	3	3	3	3	3	3	3	3	3
180	0	0	3	3	3	3	3	3	3	3	3	3	3
195	0	0	3	3	3	3	3	3	3	3	3	3	3
210	0	0	3	3	3	3	3	3	3	3	3	3	3
225	0	0	3	3	3	3	3	3	3	3	3	3	3
240	0	0	3	3	3	3	3	3	3	3	3	3	3
255	0	0	3	3	3	3	3	3	3	3	3	3	3
270	0	0	3	3	3	3	3	3	3	3	3	3	3
285	0	0	3	3	3	3	3	3	3	3	3	3	3
300	0	0	3	3	3	3	3	3	3	3	3	3	3
315	0	0	3	3	3	3	3	3	3	3	3	3	3
330	0	0	3	3	3	3	3	3	3	3	3	3	3
345	0	0	3	3	3	3	3	3	3	3	3	3	3
360	0	0	3	3	3	3	3	3	3	3	3	3	3

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	6	6	6	6	6	6	0	0	0	0
15	0	0	6	6	6	6	6	6	0	0	0	0
30	0	0	6	6	6	6	6	6	0	0	0	0
45	0	0	6	6	6	6	6	6	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	2	2	2	0	0	0	0	0
240	0	0	0	0	2	2	2	0	0	0	0	0
255	0	0	0	0	2	2	2	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	6	6	6	6	6	6	0	0	0	0
300	0	0	6	6	6	6	6	6	0	0	0	0
315	0	0	6	6	6	6	6	6	0	0	0	0
330	0	0	6	6	6	6	6	6	0	0	0	0
345	0	0	6	6	6	6	6	6	0	0	0	0
360	0	0	6	6	6	6	6	6	0	0	0	0

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	6	6	6	6	6	6	3	0	0	0
15	0	0	6	6	6	6	6	6	3	0	0	0
30	0	0	6	6	6	6	6	6	3	0	0	0
45	0	0	6	6	6	6	6	6	3	0	0	0
60	0	0	6	6	6	6	6	6	3	0	0	0
75	0	0	6	6	6	6	6	6	3	0	0	0
90	0	0	6	6	6	6	6	6	3	0	0	0
105	0	0	6	6	6	6	6	6	3	0	0	0
120	0	0	6	6	6	6	6	6	3	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	6	6	6	6	6	6	3	0	0	0
270	0	0	6	6	6	6	6	6	3	0	0	0
285	0	0	6	6	6	6	6	6	3	0	0	0
300	0	0	6	6	6	6	6	6	3	0	0	0
315	0	0	6	6	6	6	6	6	3	0	0	0
330	0	0	6	6	6	6	6	6	3	0	0	0
345	0	0	6	6	6	6	6	6	3	0	0	0
360	0	0	6	6	6	6	6	6	3	0	0	0

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8	16.6
0	0	0	0	0	0	0	3	3	3	3	3	3	3
15	0	0	0	0	0	0	3	3	3	3	3	3	3
30	0	0	0	0	0	0	3	3	3	3	3	3	3
45	0	0	0	0	0	0	3	3	3	3	3	3	3
60	0	0	0	0	0	0	3	3	3	3	3	3	3
75	0	0	0	0	0	0	3	3	3	3	3	3	3
90	0	0	0	0	0	0	3	3	3	3	3	3	3
105	0	0	0	0	0	0	3	3	3	3	3	3	3
120	0	0	0	0	0	0	3	3	3	3	3	3	3
135	0	0	0	0	0	0	3	3	3	3	3	3	3
150	0	0	0	0	0	0	3	3	3	3	3	3	3
165	0	0	0	0	0	0	3	3	3	3	3	3	3
180	0	0	0	0	0	0	3	3	3	3	3	3	3
195	0	0	0	0	0	0	3	3	3	3	3	3	3
210	0	0	0	0	0	0	3	3	3	3	3	3	3
225	0	0	0	0	0	0	3	3	3	3	3	3	3
240	0	0	0	0	0	0	3	3	3	3	3	3	3
255	0	0	0	0	0	0	3	3	3	3	3	3	3
270	0	0	0	0	0	0	3	3	3	3	3	3	3
285	0	0	0	0	0	0	3	3	3	3	3	3	3
300	0	0	0	0	0	0	3	3	3	3	3	3	3
315	0	0	0	0	0	0	3	3	3	3	3	3	3
330	0	0	0	0	0	0	3	3	3	3	3	3	3
345	0	0	0	0	0	0	3	3	3	3	3	3	3
360	0	0	0	0	0	0	3	3	3	3	3	3	3

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	6	6	6	6	6	6	3	0	0	0
15	0	0	6	6	6	6	6	6	3	0	0	0
30	0	0	6	6	6	6	6	6	3	0	0	0
45	0	0	6	6	6	6	6	6	3	0	0	0
60	0	0	6	6	6	6	6	6	3	0	0	0
75	0	0	6	6	6	6	6	6	3	0	0	0
90	0	0	6	6	6	6	6	6	3	0	0	0
105	0	0	6	6	6	6	6	6	3	0	0	0
120	0	0	6	6	6	6	6	6	3	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	6	6	6	6	6	6	3	0	0	0
270	0	0	6	6	6	6	6	6	3	0	0	0
285	0	0	6	6	6	6	6	6	3	0	0	0
300	0	0	6	6	6	6	6	6	3	0	0	0
315	0	0	6	6	6	6	6	6	3	0	0	0
330	0	0	6	6	6	6	6	6	3	0	0	0
345	0	0	6	6	6	6	6	6	3	0	0	0
360	0	0	6	6	6	6	6	6	3	0	0	0

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8	16.6
0	0	0	0	0	0	0	3	3	3	3	3	3	3
15	0	0	0	0	0	0	3	3	3	3	3	3	3
30	0	0	0	0	0	0	3	3	3	3	3	3	3
45	0	0	0	0	0	0	3	3	3	3	3	3	3
60	0	0	0	0	0	0	3	3	3	3	3	3	3
75	0	0	0	0	0	0	3	3	3	3	3	3	3
90	0	0	0	0	0	0	3	3	3	3	3	3	3
105	0	0	0	0	0	0	3	3	3	3	3	3	3
120	0	0	0	0	0	0	3	3	3	3	3	3	3
135	0	0	0	0	0	0	3	3	3	3	3	3	3
150	0	0	0	0	0	0	3	3	3	3	3	3	3
165	0	0	0	0	0	0	3	3	3	3	3	3	3
180	0	0	0	0	0	0	3	3	3	3	3	3	3
195	0	0	0	0	0	0	3	3	3	3	3	3	3
210	0	0	0	0	0	0	3	3	3	3	3	3	3
225	0	0	0	0	0	0	3	3	3	3	3	3	3
240	0	0	0	0	0	0	3	3	3	3	3	3	3
255	0	0	0	0	0	0	3	3	3	3	3	3	3
270	0	0	0	0	0	0	3	3	3	3	3	3	3
285	0	0	0	0	0	0	3	3	3	3	3	3	3
300	0	0	0	0	0	0	3	3	3	3	3	3	3
315	0	0	0	0	0	0	3	3	3	3	3	3	3
330	0	0	0	0	0	0	3	3	3	3	3	3	3
345	0	0	0	0	0	0	3	3	3	3	3	3	3
360	0	0	0	0	0	0	3	3	3	3	3	3	3

Day

wind speed at hub height (m/s)

direction	8.2	8.8	9.5	9.9	10.3	10.9	11.6	12.2	12.9	13.5	14.2	15.5
0	0	0	0	0	1	1	1	1	1	1	1	1
15	0	0	0	0	0	0	0	1	1	1	1	1
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	1	1	1	1	1
210	0	0	0	0	0	0	0	1	1	1	1	1
225	0	0	0	0	0	0	0	1	1	1	1	1
240	0	0	0	0	0	0	0	1	1	1	1	1
255	0	0	0	0	0	0	0	1	1	1	1	1
270	0	0	0	0	0	0	0	1	1	1	1	1
285	0	0	0	0	1	1	1	1	1	1	1	1
300	0	0	0	0	1	1	1	1	1	1	1	1
315	0	0	0	0	1	1	1	1	1	1	1	1
330	0	0	0	0	1	1	1	1	1	1	1	1
345	0	0	0	0	1	1	1	1	1	1	1	1
360	0	0	0	0	1	1	1	1	1	1	1	1

Night

wind speed at hub height (m/s)

Direction	8.6	8.8	9.7	10.2	10.7	11.2	11.6	12.2	12.7	13.2	13.8	14.8
0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
285	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0
315	0	0	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0