

TECHNICAL APPENDIX 11.8 - DRAFT PLANNING CONDITION

11.1 Introduction

- 1.1 In the event that the proposed wind farm is successful in gaining planning consent, the decision notice would likely contain appropriately worded noise conditions, written so as to be in accordance with Circular WGC 016/2014 'The Use of Planning Conditions for Development Management' [1].
- 1.2 Such conditions would provide a degree of protection to nearby residents should noise from the proposed wind farm cause disturbance. To that end, presented below are a set of relevant, precise and enforceable conditions that RES suggest as appropriate. The form of condition wording suggested has been used for many wind farm developments and the final conditions attached to the consent would be according to the discretion of the decision maker.
- 1.3 **Chapter 11: Acoustic** of the ES proposes a mechanism to control the operational noise levels from the proposed wind farm and the cumulative sites considered via the imposition of apportioned operational noise limits such that the overall requirements of ETSU-R-97 are, as far as practicably possible, met. The apportionment of the limits considers the relative generating capacity of each site and the proximity to neighbouring properties with a view to enabling all three sites to operate in a viable manner, whilst maximising the generating capacity of the developments. The described approach is intended to form the basis of discussions with the developers of the neighbouring wind farms and the Local Planning Authority (LPA) and is by no means finalised; there are very many different approaches which may be taken in this respect. The finalised approach would depend on the evolving design of the cumulative schemes; the results of further background noise surveys in the area (as undertaken by the respective developers); whether certain properties can be considered as financially involved with a particular development; ongoing discussions and negotiations between the developers and Local Planning Authority; whether it is considered appropriate to set limits in relation to wind direction as well as wind speed; and other planning constraints amongst other factors.
- 1.4 Two sets of noise limits for the proposed wind farm are suggested, one which considers the scenario where only the proposed wind farm is granted planning consent, and another, where the proposed Trecelyn Wind Farm and/or Mynydd Llanhilleth Wind Farm developments also become operational.

11.2 Draft Planning Condition

The rating level of noise immissions from the combined effects of the wind turbines (including the application of any tonal penalty) when determined in accordance with the attached Guidance Notes (to this condition), shall not exceed the values for the relevant integer wind speed, set out in, or derived from, the Tables attached to this condition at any dwelling which is lawfully existing or has planning permission at the date of this consent and:

- a. The Company shall continuously log power production, wind speed and wind direction, all in accordance with Guidance Note 1(d). These data shall be retained for a period of not less than 24 months. The Company shall provide this information in the format set out in Guidance Note 1(e) to the Planning Authority on its request, within 14 days of receipt in writing of such a request.
- b. No electricity shall be exported until the Company has submitted to the Planning Authority for written approval a list of proposed independent consultants who may undertake compliance measurements in accordance with this condition. Amendments to the list of approved consultants shall be made only with the prior written approval of the Local Planning Authority.



- c. Within 21 days from receipt of a written request from the Planning Authority following a complaint to it from an occupant of a dwelling alleging noise disturbance at that dwelling, the Company shall, at its expense, employ a consultant approved by the Planning Authority to assess the level of noise immissions from the wind farm at the complainant's dwelling in accordance with the procedures described in the attached Guidance Notes. The written request from the Local Planning Authority shall set out at least the date, time and location that the complaint relates to and any identified atmospheric conditions, including wind direction, and include a statement as to whether, in the opinion of the Planning Authority, the noise giving rise to the complaint contains or is likely to contain a tonal component.
- d. The assessment of the rating level of noise immissions shall be undertaken in accordance with an assessment protocol that shall, prior to the commencement of any measurements, have been submitted to and approved in writing by the Local Planning Authority. The protocol shall include the proposed measurement location identified in accordance with the Guidance Notes where measurements for compliance checking purposes shall be undertaken and also the range of meteorological and operational conditions (which shall include the range of wind speeds, wind directions, power generation and times of day) to determine the assessment of rating level of noise immissions. The proposed range of conditions shall be those which prevailed during times when the complainant alleges there was disturbance due to noise, having regard to the written request of the Planning Authority under paragraph (c), and such others as the independent consultant considers likely to result in a breach of the noise limits.
- e. Where a dwelling to which a complaint is related is not listed in the tables attached to these conditions, the Company shall submit to the Local Planning Authority for written approval proposed noise limits selected from those listed in the tables to be adopted at the complainant's dwelling for compliance checking purposes. The proposed noise limits shall be those limits selected from the Tables specified for a listed location which is the geographically nearest dwelling to the complainant's dwelling, unless otherwise agreed with the Planning Authority due to location-specific factors.
- f. The Company shall provide to the Local Planning Authority the independent consultant's assessment of the rating level of noise immissions undertaken in accordance with the Guidance Notes within 2 months of the date of the written request of the Local Planning Authority for compliance measurements to be made under paragraph (c), unless the time limit is extended in writing by the Local Planning Authority. Unless otherwise agreed in writing by the Local Planning Authority, the assessment shall be accompanied by all data collected for the purposes of undertaking the compliance measurements, such data to be provided in the format set out in Guidance Note 1(e) of the Guidance Notes with the exception of audio data which shall be supplied in the format in which it is recorded. The instrumentation used to undertake the measurements shall be calibrated in accordance with Guidance Note 1(a) and certificates of calibration shall be submitted to the Planning Authority with the independent consultant's assessment of the rating level of noise immissions.
- g. Where a further assessment of the rating level of noise immissions from the wind farm is required pursuant to Guidance Note 4(c), the Company shall submit a copy of the further assessment within 21 days of submission of the independent consultant's assessment pursuant to paragraph (d) above unless the time limit has been extended in writing by the Local Planning Authority.

Table 1 Daytime Noise Limits (Only Mynydd Maen Wind Farm Operational), dB L_{A90}

House ID	Standardised 10 m Height Wind Speed, m.s ⁻¹									
	3	4	5	6	7	8	9	10	11	12
H1	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H2	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H3	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H4	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H5	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H6	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H7	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H8	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H9	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H10	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H11	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H12	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H13	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H14	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H15	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H16	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H17	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H18	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H19	35.0	35.5	37.3	39.3	41.3	43.2	44.8	45.9	46.5	46.5
H20	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H21	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H22	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H23	39.8	40.6	41.2	41.6	42.0	42.4	42.9	43.8	45.0	46.7
H24	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3
H25	39.8	40.6	41.2	41.6	42.0	42.4	42.9	43.8	45.0	46.7
H26	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3
H27	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3
H28	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3
H29	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3
H30	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3
H31	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3
H32	37.8	38.5	39.1	39.8	40.6	41.6	42.8	44.3	46.1	48.3

Table 2 Night-time Noise Limits (Only Mynydd Maen Wind Farm Operational), dB L_{A90}

House ID	Standardised 10 m Height Wind Speed, m.s ⁻¹									
	3	4	5	6	7	8	9	10	11	12
H1	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H2	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H3	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H4	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H5	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H6	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H7	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H8	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H9	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H10	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H11	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H12	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H13	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H14	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H15	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H16	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4

House ID	Standardised 10 m Height Wind Speed, m.s ⁻¹									
	3	4	5	6	7	8	9	10	11	12
H17	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H18	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H19	43.0	43.0	43.0	43.0	43.0	43.0	43.0	44.4	46.8	49.0
H20	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H21	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H22	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H23	43.0	43.0	43.0	43.0	43.0	43.6	44.1	44.5	44.8	45.0
H24	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6
H25	43.0	43.0	43.0	43.0	43.0	43.6	44.1	44.5	44.8	45.0
H26	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6
H27	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6
H28	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6
H29	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6
H30	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6
H31	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6
H32	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.8	46.6

Note to Tables 1 & 2: The limits are stated for the scenario whereby only the proposed wind farm is granted planning consent and becomes operational without the Trecelyn and Mynydd Llanhilleth developments operating (i.e. the full extent of the ETSU-R-97 limits are applied to the proposed wind farm).

Table 3 Daytime Noise Limits (Mynydd Maen Wind Farm with Trecelyn Wind Farm and/or Mynydd Llanhilleth Wind Farm Operational), dB L_{A90}

House ID	Standardised 10 m Height Wind Speed, m.s ⁻¹									
	3	4	5	6	7	8	9	10	11	12
H1	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H2	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H3	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H4	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H5	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H6	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H7	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H8	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H9	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H10	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H11	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H12	36.0	36.5	37.2	38.0	38.8	39.7	40.7	41.6	42.5	43.3
H13	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H14	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H15	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H16	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H17	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H18	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H19	31.0	31.5	33.3	35.3	37.3	39.2	40.8	41.9	42.5	42.5
H20	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H21	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H22	37.4	38.7	39.7	40.3	40.9	41.6	42.5	44.0	46.1	49.0
H23	39.8	40.6	41.2	41.6	42.0	42.4	42.9	43.8	45.0	46.7
H24	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3
H25	39.8	40.6	41.2	41.6	42.0	42.4	42.9	43.8	45.0	46.7
H26	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3
H27	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3
H28	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3

House ID	Standardised 10 m Height Wind Speed, m.s ⁻¹									
	3	4	5	6	7	8	9	10	11	12
H29	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3
H30	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3
H31	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3
H32	36.8	37.5	38.1	38.8	39.6	40.6	41.8	43.3	45.1	47.3

Table 4 Night-time Noise Limits (Mynydd Maen Wind Farm with Treceilyn Wind Farm and/or Mynydd Llanhilleth Wind Farm Operational), dB LA90

House ID	Standardised 10 m Height Wind Speed, m.s ⁻¹									
	3	4	5	6	7	8	9	10	11	12
H1	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H2	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H3	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H4	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H5	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H6	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H7	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H8	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H9	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H10	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H11	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H12	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
H13	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H14	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H15	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H16	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H17	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H18	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H19	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	40.4	42.8
H20	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H21	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H22	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	45.4
H23	43.0	43.0	43.0	43.0	43.0	43.6	44.1	44.5	44.8	45.0
H24	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6
H25	43.0	43.0	43.0	43.0	43.0	43.6	44.1	44.5	44.8	45.0
H26	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6
H27	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6
H28	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6
H29	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6
H30	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6
H31	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6
H32	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.8	45.6

Note to Tables 3 & 4: The stated limits are intended to restrict noise levels associated with the Mynydd Maen turbines such that the combined noise level from the proposed wind farm and the proposed Treceilyn Wind Farm and/or Mynydd Llanhilleth Wind Farm sites operating at the same time meet the overall requirements of ETSU-R-97 (i.e. the ETSU-R-97 noise limits have been apportioned between the proposed wind farms considered such that the overall ETSU-R-97 limits would be expected to be met).

Table 5 Co-Ordinate Locations of the Dwellings Listed at Tables 1, 2, 3 and 4

House ID	House Name	OSGB Co-Ordinates	
		X (m)	Y (m)
H1	CRAIG LLYWARCH FARM	326210	194820
H2	LLANDERFEL FARM	326579	195374
H3	BROOK COTTAGE	326588	195429
H4	GARN WEN FARM	326734	196171
H5	ANNEX AT GARNWEN FARM	326727	196182
H6	GELLI-GRAVOG FARM	326837	196473
H7	BELLE VUE HOUSE	327336	196553
H8	CARAVAN TROED Y RHIW	326674	196560
H9	HIGH SPRING FARM	326661	196603
H10	TROED Y RHIW COTTAGE	326661	196603
H11	31 THE SQUARE	327144	196778
H12	2 MINESLOPE COTTAGE	327051	197041
H13	GLYN BRAN COTTAGE	327521	197242
H14	YEW TREE FARM	327593	197332
H15	LITTLE GREENMEADOW FARM	327513	197533
H16	WAIN HYWEL	327632	197700
H17	MOUNTAIN AIR	327721	197851
H18	WHITE HOUSE	327739	198286
H19	PEN Y CAEAU FARM	323260	198290
H20	TY-CARREG BARN	328158	198662
H21	TY CAREG BARN, CWRDY LANE	328158	198662
H22	PARISH COTTAGE	328043	198908
H23	CWMLICKEY BUNGALOW	327242	199064
H24	TY SHON SHENKIN	324071	199178
H25	BLAENDARE HOUSE	327114	199406
H26	SWALLOW BARN	324931	199624
H27	THE OLD SCHOOL HOUSE	324451	199628
H28	PWLL Y DOMEN COTTAGE	324974	199647
H29	MOUNTAINVIEW HOUSE	325371	199892
H30	WOODLAND FARM	325767	200086
H31	CRISPIN	326178	200117
H32	LEIGH BUNGALOW	326722	200296

Note to Table 5: The geographical coordinate references are provided for the purpose of identifying the general location of dwellings to which a given set of noise limits applies.

Reason: To protect the amenity of the area.

Guidance Notes

These notes are to be read with and form part of the noise condition. They further explain the condition and specify the methods to be employed in the assessment of complaints about noise immissions from the wind farm. The rating level at each integer wind speed is the arithmetic sum of the wind farm noise level as determined from the best-fit curve described in Guidance Note 2 of these Guidance Notes and any tonal penalty applied in accordance with Guidance Note 3. Reference to ETSU-R-97 refers to the publication entitled "The Assessment and Rating of Noise from Wind Farms" (1997) published by the Energy Technology Support Unit (ETSU) for the Department of Trade and Industry (DTI).

Guidance Note 1

- (a) Values of the $L_{A90,10\text{-minute}}$ noise statistic should be measured at the complainant's property, using a sound level meter 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 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). This should 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). Measurements shall be undertaken in such a manner to enable a tonal penalty to be applied in accordance with Guidance Note 3.

- (b) The microphone should be mounted at 1.2 - 1.5 metres above ground level, fitted with a two-layer windshield or suitable equivalent approved in writing by the Local Planning Authority, and placed outside the complainant's dwelling. 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. In the event that the consent of the complainant for access to his or her dwelling to undertake compliance measurements is withheld, the wind farm operator shall submit for the written approval of the Planning Authority details of the proposed alternative representative measurement location prior to the commencement of measurements and the measurements shall be undertaken at the approved alternative representative measurement location.
- (c) The $L_{A90,10\text{-minute}}$ measurements should be synchronised with measurements of the 10-minute arithmetic mean wind and operational data logged in accordance with Guidance Note 1(d), including the power generation data from the turbine control systems of the wind farm.
- (d) To enable compliance with the conditions to be evaluated, the wind farm operator shall continuously log arithmetic mean wind speed in metres per second and wind direction in degrees from north at hub height for each turbine, and at any on site meteorological mast(s), if available, together with the arithmetic mean power generated by each turbine, all in successive 10-minute periods. All 10-minute arithmetic average mean wind speed data measured at hub height shall be 'standardised' to a reference height of 10 metres as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05 metres. It is this standardised 10 metre height wind speed data, as determined from whichever source is agreed in writing with the Local Planning Authority as being most appropriate to the noise compliance measurements being undertaken, which is correlated with the noise measurements determined as valid in accordance with Guidance Note 2, such correlation to be undertaken in the manner described in Guidance Note 2. All 10-minute periods shall commence on the hour and in 10-minute increments thereafter.
- (e) Data provided to the Planning Authority in accordance with the noise condition shall be provided in comma separated values in electronic format.
- (f) A data logging rain gauge shall be installed during the assessment of the levels of noise immissions. The gauge shall record over successive 10-minute periods synchronised with the periods of data recorded in accordance with Note 1(d).

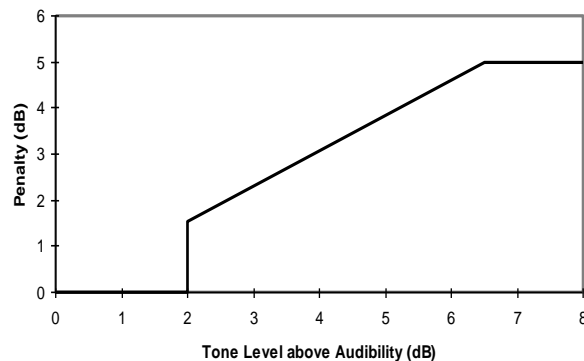
Guidance Note 2

- (a) The noise measurements shall be made so as to provide not less than 20 valid data points as defined in Guidance Note 2 (b).
- (b) Valid data points are those measured in the conditions specified in the agreed written protocol under paragraph (d) of the noise condition but excluding any periods of rainfall measured in the vicinity of the sound level meter. Rainfall shall be assessed by use of a rain gauge that shall log the occurrence of rainfall in each 10-minute period concurrent with the measurement periods set out in Guidance Note 1.
- (c) For those data points considered valid in accordance with Guidance Note 2(b), values of the $L_{A90,10\text{-minute}}$ noise measurements and corresponding values of the 10-minute standardised ten metre height wind speed, as derived from the site measured wind speed source(s) agreed in writing with the Planning Authority in accordance with Guidance Note 1(d), shall be plotted on separate XY charts for each wind direction considered, with noise level on the Y-axis and the standardised mean wind speed on the

X-axis. A least-squares, “best fit” curve of an order deemed appropriate by the independent consultant (but which may not be higher than a fourth order) should be fitted to the data points and define the wind farm noise level at each integer speed and direction.

Guidance Note 3

- (a) Where, in accordance with the approved assessment protocol under paragraph (d) of the noise condition, noise immissions at the location or locations where compliance measurements are being undertaken contain or are likely to contain a tonal component, a tonal penalty is to be calculated and applied using the following rating procedure.
- (b) For each 10-minute interval for which $L_{A90,10\text{-minute}}$ data have been determined as valid in accordance with Guidance Note 2 a tonal assessment shall be performed on noise immissions during 2 minutes of each 10-minute period. The 2-minute periods should be spaced at 10-minute intervals provided that uninterrupted uncorrupted data are available (“the standard procedure”). Where uncorrupted data are not available, the first available uninterrupted clean 2-minute period out of the affected overall 10-minute period shall be selected. Any such deviations from the standard procedure, as described in Section 2.1 on pages 104-109 of ETSU-R-97, shall be reported.
- (c) For each of the 2-minute samples the tone level above or below audibility shall be calculated by comparison with the audibility criterion given in Section 2.1 on pages 104-109 of ETSU-R-97.
- (d) The average tone level above audibility shall be calculated for each wind speed bin, each bin being 1 metre per second wide and centred on integer wind speeds, for each wind direction. Samples for which the tones were below the audibility criterion or no tone was identified, a value of zero audibility shall be substituted.
- (e) The tonal penalty for each wind speed bin is derived from the margin above audibility of the tone according to the figure below.



Guidance Note 4

- (a) If a tonal penalty is to be applied in accordance with Guidance Note 3 the rating level of the turbine noise at each wind speed and wind direction is the arithmetic sum of the measured noise level as determined from the best fit curve described in Guidance Note 2 and the penalty for tonal noise as derived in accordance with Guidance Note 3 at each integer wind speed and wind direction within the range specified by the Local Planning Authority in its written protocol under paragraph (d) of the noise condition.
- (b) If no tonal penalty is to be applied then the rating level of the turbine noise at each wind speed and wind direction is equal to the measured noise level as determined from the best fit curve described in Guidance Note 2.

- (c) In the event that the rating level is above the limit(s) set out in the Tables attached to the noise conditions or the noise limits for a complainant's dwelling approved in accordance with paragraph (e) of the noise condition, the independent consultant shall undertake a further assessment of the rating level to correct for background noise so that the rating level relates to wind turbine noise immission only.
- (d) The wind farm operator shall ensure that all necessary wind turbines in the development are turned off for such period as the independent consultant requires to undertake any further noise measurements required under Guidance Note 4(c). If the number of turbines to be turned off are less than the total number of turbines on the site then this shall be agreed in advance with the Planning Authority.
- (e) To this end, the steps in Guidance Note 2 shall be repeated with the required number of turbines shutdown in accordance with Guidance Note 4(d) in order to determine the background noise (L3) at each integer wind speed within the range requested by the Planning Authority in its written request under paragraph (c) and the approved protocol under paragraph (d) of the noise condition.
- (f) The wind farm noise (L1) at this speed shall then be calculated as follows where L2 is the measured level with turbines running but without the addition of any tonal penalty:

$$L_1 = 10 \log \left[10^{L_2/10} - 10^{L_3/10} \right]$$

- (g) The rating level shall be re-calculated by arithmetically adding the tonal penalty (if any is applied in accordance with Note 3) to the derived wind farm noise L1 at that integer wind speed and wind direction.
- (h) If the rating level after adjustment for background noise contribution and adjustment for tonal penalty (if required in accordance with Guidance Note 3 above) at any integer wind speed and wind direction lies at or below the values set out in the Tables attached to the conditions or at or below the noise limits approved by the Planning Authority for a complainant's dwelling in accordance with paragraph (e) of the noise condition then no further action is necessary. If the rating level at any integer wind speed and wind direction exceeds the values set out in the Tables attached to the conditions or the noise limits approved by the Local Planning Authority for a complainant's dwelling in accordance with paragraph (e) of the noise condition, then the development fails to comply with the conditions.

11.3 References

- [1] Welsh Government (October 2014) Circular WGC 016/2014 'The Use of Planning Conditions for Development Management'