



APPENDIX 12-3
**NOISE PREDICTION INPUTS
AND PARAMETERS**

APPENDIX 12.3 CALCULATION PARAMETERS AND SETTINGS FOR NOISE MODEL

Prediction calculations for turbine noise have been conducted in accordance with *ISO 9613: Acoustics – Attenuation of sound outdoors, Part 2: General method of calculation, 1996*. Guidance in terms of the calculation settings has been obtained from the Institute of Acoustics (IOA) Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (2013) (IOA GPG) and its associated supplementary guidance notes. The following are the main aspects that have been considered in terms of the noise predictions presented in this instance.

Ground Effect:

Ground effect is the result of sound reflected by the ground interfering with the sound propagating directly from source to receiver. The prediction of ground effects is inherently complex and depend on source height receiver height propagation height between the source and receiver and the ground conditions.

The ground conditions are described according to a variable defined as G, which varies between 0.0 for hard ground (including paving, ice concrete) and 1.0 for soft ground (includes ground covered by grass trees or other vegetation).

Noise predictions have been carried out using a source height corresponding to the hub height of the proposed turbines, a receiver height of 4m and a ground effect factor of G=0.5.

Geometrical Divergence

This term relates to the spherical spreading in the free-field from a point sound source resulting in an attenuation depending on distance according to the following equation:

$$A_{\text{geo}} = 20 \times \log(d) + 11$$

where d = distance from the source

A wind turbine may be considered as a point source beyond a distance corresponding to one rotor diameter.

Atmospheric Adsorption

Sound propagation through the atmosphere is attenuated by the conversion of the sound energy into heat. This attenuation is dependent on the temperature and relative humidity of the air through which the sound is travelling and is frequency dependent with increasing attenuation towards higher frequencies.

In accordance with the guidance set out in the IOA GPG for calculations, a temperature of 10°C and a relative humidity of 70% have been used, which give relatively low levels of atmosphere attenuation and corresponding worst case noise predictions.

CALCULATION PARAMETERS AND SETTINGS (Continued)

A full list of the coordinates of the noise sensitive receptors (NSLs) is included in the following table. Noise predictions calculations were undertaken at a height of 4m above ground at all NSL's in accordance with the IOA GPG.

Coordinates for NSLs used in the assessment

NSL Ref.	Coordinates – Irish Transverse Mercator (ITM)		NSL Ref	Coordinates – Irish Transverse Mercator (ITM)	
	ITM X	ITM Y		ITM X	Northing
H001	614722	676870	H073	614524	674082
H002	613783	677556	H074	612080	676029
H003	613812	677585	H075	614254	676107
H004*	612643	676702	H076	611435	674518
H005*	611884	674005	H077	611498	674034
H006*	611950	673742	H078	612234	676764
H007*	611908	673866	H079	611496	674010
H008	612396	673207	H080	614293	675530
H009	612529	675639	H081	613018	672604
H010	612031	675046	H082	614536	674288
H011	613893	676097	H083	611504	673959
H012	611890	674934	H084	611506	673944
H013	613560	673088	H085	612985	672581
H014	612357	676471	H086	612063	676505
H015	611974	675012	H087	612054	675865
H016	614177	674460	H089	611407	674109
H017	614106	677858	H090	612959	672560
H018	614201	674431	H091	613150	672552
H019	613638	677641	H092	612940	672541
H020	611883	674949	H092	612940	672541
H021	612814	677164	H093	613018	672518
H022	614238	674393	H094	613941	678184
H023	614259	674364	H095	612964	672502
H024	612317	676451	H099	614456	675589
H025	613914	673345	H101	611275	674655
H026	612701	676980	H102	612853	672449
H027	611889	674985	H104	611495	673603

NSL Ref.	Coordinates – Irish Transverse Mercator (ITM)		NSL Ref	Coordinates – Irish Transverse Mercator (ITM)	
	ITM X	ITM X		ITM X	Northing
H028	613659	673134	H106*	611846	675477
H029	613567	677623	H107	611586	673315
H030	614073	673433	H109	613622	678195
H031	614208	676286	H110	612300	677176
H032	612283	676428	H111	612310	677228
H033	611897	675018	H112	614772	674355
H034	614939	676796	H113	614553	675609
H035	614619	677788	H116	614830	674023
H036	613878	675070	H117	612473	677567
H037	613698	673137	H118	613605	672465
H038	612250	676404	H121	611411	673490
H039	612501	672968	H123	611413	673462
H040	613858	673260	H124	611415	673432
H041	614131	677941	H125	612313	677413
H042	613831	673238	H126	612432	677580
H043	613907	674975	H128	611414	673395
H044	613615	677754	H129	611426	673366
H045	614335	674391	H130	612694	672321
H046	613809	673212	H131	614626	675552
H047	611938	675124	H132	612324	677462
H048	614155	673417	H133	611408	673312
H049	613501	672885	H134	612228	677371
H050	613962	674826	H135	614933	674028
H051	613455	672846	H137	614955	674043
H052	612199	676446	H138	614832	673459
H053	613595	677783	H139	611035	674691
H054	612551	672854	H140	611378	673278
H055	613506	672852	H141	614967	674099
H056	612141	675265	H142	614832	675814
H057*	612145	676140	H144	612293	677619
H058	614268	673489	H148	611665	672780
H059	614198	675735	H150	611342	673140
H060	612561	672827	H151	611339	673116

NSL Ref.	Coordinates – Irish Transverse Mercator (ITM)		NSL Ref	Coordinates – Irish Transverse Mercator (ITM)	
	ITM X	ITM Y		ITM X	Northing
H061	612040	675244	H155	611338	673088
H062	611501	674504	H159	611336	673056
H063	614189	675892	H162	611335	673024
H064	613375	672745	H164	611186	673258
H065	612109	676141	H167	612436	677975
H066	614320	678035	H173	611360	672910
H067	613219	672692	H364	613544	672528
H068	613339	672716	H370	614893	676982
H069	612202	676627			
H071	614419	673620			
H072*	614294	674665			

* = Landowner