

SANDY KNOWE WIND FARM SECTION 36 APPLICATION

Revised Noise Assessment

October 2019

Appendix F – Modelled Sound Power
Levels of Wind Farms



				Turbine type used in noise assessment
Glenmuckloch	Hub heights (m)	X	Y	
T1	90	269345	615600	Enercon E-126 2.4 MW
T2	90	269789	615457	Enercon E-126 2.4 MW
T3	90	269800	615828	Enercon E-126 2.4 MW
T4	90	270281	615722	Enercon E-126 2.4 MW
T5	90	270313	616246	Enercon E-126 2.4 MW
T6	90	270863	616092	Enercon E-126 2.4 MW
T7	90	271345	616256	Enercon E-126 2.4 MW
T8	90	271744	616627	Enercon E-126 2.4 MW

				Turbine type used in noise assessment
Whiteside Hill	Hub heights (m)	X	Y	
T2	69.7	270905	604899	GE 2.85 - 103 WTG
T3	69.7	271047	604579	GE 2.85 - 103 WTG
T4	69.7	271528	604749	GE 2.85 - 103 WTG
T5	69.7	271748	605145	GE 2.85 - 103 WTG
T6	69.7	271764	605490	GE 2.85 - 103 WTG
T7	69.7	270979	605290	GE 2.85 - 103 WTG
T8	69.7	271920	604847	GE 2.85 - 103 WTG
T9	69.7	272351	605270	GE 2.85 - 103 WTG
T10	69.7	272494	605657	GE 2.85 - 103 WTG
T13	69.7	272692	606090	GE 2.85 - 103 WTG

				Turbine type used in noise assessment
Sanquhar Community	Hub heights (m)	X	Y	
SCT9	74	269714	607527	VestasV112
SCT8	74	270089	607069	VestasV112
SCT7	74	270745	607985	VestasV112
SCT5	74	270476	607158	VestasV112
SCT4	74	270967	607108	VestasV112
SCT3	74	271398	607240	VestasV112
SCT12	74	268760	607612	VestasV112
SCT11	74	269085	607945	VestasV112
SCT01	74	271343	607571	VestasV112

				Turbine type used in noise assessment
Sanquhar Six	Hub heights (m)	X	Y	
SanqSixT06	77.5	267071	605656	SenvMM92
SanqSixT05	77.5	267418	606025	SenvMM92
SanqSixT04	77.5	267638	606605	SenvMM92
SanqSixT03	77.5	268104	606865	SenvMM92
SanqSixT02	77.5	268565	607161	SenvMM92
SanqSixT01	77.5	268961	607041	SenvMM92

				Turbine type used in noise assessment
Hare Hill Extension	Hub heights (m)	X	Y	
HHET36	65	266260	607679	GamesaG52
HHET35	60	266211	607920	GamesaG52
HHET34	65	266402	607844	GamesaG52
HHET33	65	266597	607835	GamesaG52
HHET32	65	267011	607971	GamesaG52
HHET31	49	266843	608102	GamesaG52
HHET30	65	267046	608196	GamesaG52
HHET29	65	267290	608344	GamesaG52
HHET28	65	267500	608531	GamesaG52
HHET27	65	267250	608591	GamesaG52
HHET26	65	267095	608430	GamesaG52
HHET25	65	266877	608356	GamesaG52
HHET24	49	266692	608236	GamesaG52
HHET23	44	266489	608292	GamesaG52
HHET22	49	266311	608361	GamesaG52
HHET21	65	266285	608577	GamesaG52
HHET20	49	266039	608525	GamesaG52
HHET19	49	265945	608741	GamesaG52
HHET18	60	266130	608856	GamesaG52
HHET17	65	266333	608796	GamesaG52
HHET16	65	266539	608766	GamesaG52
HHET15	65	266676	608935	GamesaG52
HHET14	65	266461	608968	GamesaG52
HHET13	60	266254	609029	GamesaG52
HHET12	60	266052	609046	GamesaG52
HHET11	55	265807	608960	GamesaG52
HHET10	44	265612	608929	GamesaG52
HHET09	49	265671	609199	GamesaG52
HHET08	55	265880	609192	GamesaG52
HHET07	65	266039	609350	GamesaG52
HHET06	65	266262	609336	GamesaG52
HHET05	65	266432	609456	GamesaG52
HHET04	49	265774	609399	GamesaG52
HHET03	60	266048	609562	GamesaG52
HHET02	49	266246	609582	GamesaG52
HHET01	49	266488	609723	GamesaG52

Standardised 10m wind speed	4	5	6	7	8	9	10	11	12
Sound power level, dB(A)	97.4	102.1	104.7	106.0	106.6	106.9	107.0	107.0	107.0
2 dB uncertainty added	99.4	104.1	106.7	108.0	108.6	108.9	109.0	109.0	109.0
Octave band centre frequency at 10m/s	31.5	63	125	250	500	1000	2000	4000	8000
Level, Hz		90.1	95.9	99.7	101.6	101.2	98.6	90.4	69.5

Spectrum applied across range of wind speeds, normalised to total A-weighted value for each wind speed within noise model

Standardised 10m wind speed	3	4	5	6	7	8	9	10	11
Sound power level, dB(A)	92.4	92.9	97.1	102.1	104.0	104.0	104.0	104.0	104.0
2 dB uncertainty added	94.4	94.9	99.1	104.1	106.0	106.0	106.0	106.0	106.0
Octave band centre frequency at 10m/s	31.5	63	125	250	500	1000	2000	4000	8000
Level, Hz 3m/s wind speed	69.3	78.5	82.2	83.3	84.9	87.1	86.0	76.8	58.7
Level, Hz 4m/s wind speed	69.3	78.6	82.7	84.4	84.7	86.7	87.5	80.0	59.0
Level, Hz 5m/s wind speed	72.8	82.3	86.9	89.0	88.9	90.4	91.6	85.3	64.5
Level, Hz 6m/s wind speed	77.4	87.0	91.7	94.1	94.7	95.5	96.1	90.4	71.3
Level, Hz 7m/s wind speed	79.3	89.2	93.7	95.3	96.7	97.9	97.8	92.0	72.9
Level, Hz 8m/s wind speed	79.4	89.2	93.7	95.0	96.4	98.0	98.1	91.8	72.1
Level, Hz 9m/s wind speed	79.4	89.1	93.6	94.7	96.1	98.2	98.4	91.3	71.4
Level, Hz 10m/s wind speed	79.7	89.3	93.5	93.6	94.8	99.3	98.6	89.7	71.0

Standardised 10m wind speed	4	5	6	7	8	9	10	11	12+
Sound power level, dB(A)	-	95.0	96.8	100.6	104.1	106.8	106.8	106.8	106.8
2 dB uncertainty added	-	97.0	98.8	102.6	106.1	108.8	108.8	108.8	108.8
Octave band centre frequency	31.5	63	125	250	500	1000	2000	4000	8000
5m/s (Hz)	65.7	76.7	85.1	89.3	91.0	91.9	88.5	83.6	69.5
6m/s (Hz)	66.9	77.6	86.7	91.0	92.8	93.8	90.3	85.5	71.6
7m/s (Hz)	70.7	81.2	90.6	94.9	96.6	97.6	94.1	89.2	75.3
8m/s (Hz)	74.2	84.8	94.2	98.5	100.1	101.1	97.6	92.7	78.7
9m/s (Hz)	76.3	87.4	96.6	101.1	102.8	104.0	100.3	95.5	81.9

Maximum SWL reached at 9m/s wind speed. 9m/s data applied to higher wind speeds

Standardised 10m wind speed	3	4	5	6	7	8	9	10	11+
Sound power level, dB(A)	89.2	92.5	97	100.7	103	103.2	103.2	103.2	103.2
1.6 dB uncertainty added	90.8	94.1	98.6	102.3	104.6	104.8	104.8	104.8	104.8
Octave band centre frequency	31.5	63	125	250	500	1000	2000	4000	8000
5m/s (Hz)	65.7	70.9	79.1	84.7	86.4	84.4	78.7	72.0	68.8
6m/s (Hz)	66.9	74.2	82.4	88.0	89.7	87.7	82.0	75.3	72.1
7m/s (Hz)	70.7	78.7	86.9	92.5	94.2	92.2	86.5	79.8	76.6
8m/s (Hz)	74.2	82.4	90.6	96.2	97.9	95.9	90.2	83.5	80.3
9m/s (Hz)	76.3	84.7	92.9	98.5	100.2	98.2	92.5	85.8	82.6

Maximum SWL reached at 9m/s wind speed. 9m/s data applied to

Standardised 10m wind speed	4	5	6	7	8	9	10	11	12+
Sound power level, dB(A)	93.6	98.0	101.8	103.1	103.8	103.8	103.8	103.8	103.8
2 dB uncertainty added	95.6	100.0	103.8	105.1	105.8	105.8	105.8	105.8	105.8
Octave band centre frequency at 10m/s	31.5	63	125	250	500	1000	2000	4000	8000
Level, Hz	-	82.4	88.9	93.3	94.7	93.8	90.9	85.2	72.8

Spectrum applied across range of wind speeds, normalised to total A-weighted value for each wind speed within noise model

Hare Hill	Hub heights (m)	X	Y	Turbine type used in noise assessment
HHT20	39	266964	610359	VestasV47
HHT19	39	267062	610187	VestasV47
HHT18	39	266927	609935	VestasV47
HHT17	39	266740	610015	VestasV47
HHT16	39	265903	609878	VestasV47
HHT15	39	265648	609943	VestasV47
HHT14	39	265476	609823	VestasV47
HHT13	39	265461	610028	VestasV47
HHT12	39	265296	609853	VestasV47
HHT11	39	265101	609206	VestasV47
HHT10	39	265039	609358	VestasV47
HHT09	39	264992	609513	VestasV47
HHT08	39	264845	609591	VestasV47
HHT07	39	265020	609749	VestasV47
HHT06	39	265023	609932	VestasV47
HHT05	39	264855	610060	VestasV47
HHT04	39	264661	610155	VestasV47
HHT03	39	264663	609953	VestasV47
HHT02	39	264501	610048	VestasV47
HHT01	39	264554	610274	VestasV47

Standardised 10m wind speed	4	5	6	7	8	9	10	11	12+
Sound power level, dB(A)	101.0	101.5	101.9	102.4	102.8	103.3	103.7	104.2	104.6
2 dB uncertainty added	103.0	103.5	103.9	104.4	104.8	105.3	105.7	106.2	106.6
Octave band centre frequency at 10m/s Level, Hz	31.5	63	125	250	500	1000	2000	4000	8000
Spectrum applied across range of wind speeds, normalised to total A-weighted value for each wind speed within noise model	-	78.2	86.1	89.8	95.2	97.0	92.9	87.9	69.2

Ulzieside	Hub heights (m)	X	Y	Turbine type used in noise assessment
T1	80	272537	604980	Siemens SWT 3.4 101 (assumed)
T2	80	273057	605692	Siemens SWT 3.4 101 (assumed)
T3	80	273164	606026	Siemens SWT 3.4 101 (assumed)
T4	80	272911	605285	Siemens SWT 3.4 101 (assumed)
T5	80	272988	606347	Siemens SWT 3.4 101 (assumed)
T6	80	273372	605682	Siemens SWT 3.4 101 (assumed)
T7	80	273258	605323	Siemens SWT 3.4 101 (assumed)
T8	80	273556	605878	Siemens SWT 3.4 101 (assumed)
T9	80	273556	606189	Siemens SWT 3.4 101 (assumed)
T10	80	273820	606148	Siemens SWT 3.4 101 (assumed)
T11	80	272503	605363	Siemens SWT 3.4 101 (assumed)
T12	80	272730	605949	Siemens SWT 3.4 101 (assumed)

Standardised 10m wind speed	4	5	6	7	8	9	10	11	12+
Sound power level, dB(A)	96	101.6	106.3	108.5	109	109	109	109	109
1.6 dB uncertainty added									
Octave band centre frequency Level, Hz at 6m/s	31.5	63	125	250	500	1000	2000	4000	8000
Level, Hz at 8m/s		78.1	82.3	87	89.3	92.3	89.8	84.3	70.3
Spectrum applied across range of wind speeds, normalised to total A-weighted value for each wind speed within noise model.		85.2	89.4	94.1	96.4	99.4	96.9	91.4	77.4
6m/s spectrum applied up to A-weighted levels up to 7m/s. 6m/s spectrum applied up to A-weighted levels up to 7m/s. 8m/s spectrum applied to A-weighted broad-band levels at 8m/s and above.									

Sandy Knowe	Hub heights (m)	X	Y	Turbine type used in noise assessment
SK_T24	75	270764	610503	Siemens SWT 3.4 101
SK_T23	75	270830	610051	Siemens SWT 3.4 101
SK_T22	75	270579	609876	Siemens SWT 3.4 101
SK_T21	75	270187	609664	Siemens SWT 3.4 101
SK_T20	75	270151	610007	Siemens SWT 3.4 101
SK_T19	75	270402	610182	Siemens SWT 3.4 101
SK_T18	75	270382	610471	Siemens SWT 3.4 101
SK_T17	75	270428	610753	Siemens SWT 3.4 101
SK_T16	75	269685	609866	Siemens SWT 3.4 101
SK_T15	75	269724	610136	Siemens SWT 3.4 101
SK_T14	75	269962	610498	Siemens SWT 3.4 101
SK_T13	75	269913	610787	Siemens SWT 3.4 101
SK_T12	75	269050	609876	Siemens SWT 3.4 101
SK_T11	75	269198	610102	Siemens SWT 3.4 101
SK_T10	75	269408	610668	Siemens SWT 3.4 101
SK_T09	75	269488	611065	Siemens SWT 3.4 101
SK_T08	75	268627	609893	Siemens SWT 3.4 101
SK_T07	75	268720	610143	Siemens SWT 3.4 101
SK_T06	75	268807	610399	Siemens SWT 3.4 101
SK_T05	75	269030	610590	Siemens SWT 3.4 101
SK_T04	75	268892	610887	Siemens SWT 3.4 101
SK_T03	75	269055	611108	Siemens SWT 3.4 101
SK_T02	75	269201	611337	Siemens SWT 3.4 101
SK_T01	75	269572	611396	Siemens SWT 3.4 101

Lethans	Hub heights (m)	X	Y	Turbine type used in noise assessment
Leth_T2	84	267304	616050	Siemens SWT 3.4 101
Leth_T4	100	267659	615861	Siemens SWT 3.4 101
Leth_T7	100	268276	615658	Siemens SWT 3.4 101
Leth_T8	100	268281	616110	Siemens SWT 3.4 101
Leth_T10	100	268879	615851	Siemens SWT 3.4 101
Leth_T11	124	268835	616269	Siemens SWT 3.4 101
Leth_T12	84	269553	615816	Siemens SWT 3.4 101
Leth_T13	124	269370	616268	Siemens SWT 3.4 101
Leth_T14	84	270016	616147	Siemens SWT 3.4 101
Leth_T15	100	269915	616551	Siemens SWT 3.4 101
Leth_T16	124	269937	616993	Siemens SWT 3.4 101
Leth_T17	84	270537	616352	Siemens SWT 3.4 101
Leth_T18	100	270480	616729	Siemens SWT 3.4 101
Leth_T19	84	270518	617179	Siemens SWT 3.4 101
Leth_T20	84	270980	616266	Siemens SWT 3.4 101
Leth_T21	100	271015	617019	Siemens SWT 3.4 101
Leth_T22	100	270907	617606	Siemens SWT 3.4 101
Leth_T23	84	271316	616752	Siemens SWT 3.4 101
Leth_T24	100	271687	617237	Siemens SWT 3.4 101
Leth_T25	124	271399	617529	Siemens SWT 3.4 101
Leth_T26	100	270166	617437	Siemens SWT 3.4 101
Leth_T27	124	270216	617487	Siemens SWT 3.4 101



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