Appendix 9.6 Derivation of Residual Noise Limits

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Daytime period

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
STAGE 0 – Determine the existing noise level at each NSR arising from ALL cumulative turbines. *Provided for information only and not used for derivation of noise limits.*												
			Predicted level from small turbines, dBL_{A90}									
Crowber	NSR1	No	17.6	19.7	21.8	23.9	26.0	28.1	30.2	32.3	34.4	
Lesshamar	NSR2	No	12.4	14.5	16.6	18.7	20.8	22.9	25.0	27.1	29.2	
North Guith	NSR3	No	12.5	14.6	16.7	18.8	20.9	23.0	25.1	27.2	29.3	
Mid Guith	NSR4	No	15.4	17.5	19.6	21.7	23.8	25.9	28.0	30.1	32.2	
Benstonhall	NSR5	No	22.6	24.7	26.8	28.9	31.0	33.1	35.2	37.3	39.4	
Bredakirk	NSR6	Yes	26.0	28.1	30.2	32.3	34.4	36.5	38.6	40.7	42.8	
Shoehall	NSR7	No	21.7	23.8	25.9	28.0	30.1	32.2	34.3	36.4	38.5	
Newark	NSR8	Yes	27.8	29.9	32.0	34.1	36.2	38.3	40.4	42.5	44.6	
Fers Ness	NSR9	Yes	24.1	26.2	28.3	30.4	32.5	34.6	36.7	38.8	40.9	
High Hill	NSR10	No	3.6	5.7	7.8	9.9	12.0	14.1	16.2	18.3	20.4	
STAGE 1 – Determine the existing noise level at each NSR arising from cumulative turbines. *At NSRs which have their own turbine(s) and may therefore be considered to have Financially Involved (FI) noise limits applicable to their own turbine(s), predicted noise levels exclude noise from their turbine(s).*												
			Predicted level from small turbines, dBL_{A90}									
Crowber	NSR1	No	17.6	19.7	21.8	23.9	26.0	28.1	30.2	32.3	34.4	
Lesshamar	NSR2	No	12.4	14.5	16.6	18.7	20.8	22.9	25.0	27.1	29.2	
North Guith	NSR3	No	12.5	14.6	16.7	18.8	20.9	23.0	25.1	27.2	29.3	
Mid Guith	NSR4	No	15.4	17.5	19.6	21.7	23.8	25.9	28.0	30.1	32.2	
Benstonhall	NSR5	No	22.6	24.7	26.8	28.9	31.0	33.1	35.2	37.3	39.4	Predicted level exceeds 35 dB limit at higher wind speeds – upper extent of existing noise limits is 10m/s

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
Bredakirk	NSR6	Yes	13.6	15.7	17.8	19.9	22.0	24.1	26.2	28.3	30.4	Predicted levels exclude contribution of Bredakirk turbine
Shoehall	NSR7	No	21.7	23.8	25.9	28.0	30.1	32.2	34.3	36.4	38.5	
Newark	NSR8	Yes	14.3	16.4	18.5	20.6	22.7	24.8	26.9	29.0	31.1	Predicted levels exclude contribution of Newark turbine
Fers Ness	NSR9	Yes	0.0	0.0	0.0	1.5	3.6	5.7	7.8	9.9	12.0	Predicted levels exclude contribution of Fers Ness turbine
High Hill	NSR10	No	3.6	5.7	7.8	9.9	12.0	14.1	16.2	18.3	20.4	
STAGE 2 – Where the predicted level from cumulative turbines is ≥10 dB below the 35 dB simplified ETSU limit, no significant cumulative effects with the Proposed Development will occur.												
			Predicted level from small turbines ≥10 dB below simplified ETSU limit/FI limit (where applicable)? Where TRUE the Proposed Development can meet simplified ETSU 35 dB limit without cumulative noise causing exceedance. Where FALSE predicted level from small turbines is within 10 dB of simplified ETSU noise limit and cumulative effects may occur. Note: simplified ETSU limit in planning conditions only covers up to 10 m/s wind speed. At NSR9 and NSR10 Stage 1 confirms that no cumulative effects will occur at 11 or 12 m/s, given the negligible contributions from existing turbines, so further consideration of cumulative effects are screened out at these NSRs.									
Crowber	NSR1	No	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE			Potential cumulative effects at higher wind speeds
Lesshamar	NSR2	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE			Potential cumulative effects at higher wind speeds
North Guith	NSR3	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE			Potential cumulative effects at higher wind speeds
Mid Guith	NSR4	No	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE			Potential cumulative effects at higher wind speeds
Benstonhall	NSR5	No	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE			Potential cumulative effects at mid-high wind speeds
Bredakirk	NSR6	Yes	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE			Potential cumulative effects at higher wind speeds
Shoehall	NSR7	No	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE			Potential cumulative effects at mid-high wind speeds
Newark	NSR8	Yes	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE			Potential cumulative effects at higher wind speeds
Fers Ness	NSR9	Yes	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	No cumulative effects at any wind speed
High Hill	NSR10	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	No cumulative effects at any wind speed
STAGE 3 – At wind speeds at which potential cumulative effects may occur, the predicted cumulative level (excluding noise from the Proposed Development and noise from FI turbines at NSRs which are FI with those turbines, the presence of significant headroom (>5 dB) is determined.												
			At wind speeds where potential cumulative effects identified, comparison of predicted noise level from small turbines with derived Overall Noise Limit (ONL). **Noise limit minus predicted level, dB**									

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
Crowber	NSR1	No	-	-	-	-	14.3	14.9	16.2	14.1	12.0	Significant headroom (>5 dB) at all wind speeds
Lesshamar	NSR2	No	-	-	-	-	-	-	21.4	19.3	17.2	Significant headroom (>5 dB) at all wind speeds
North Guith	NSR3	No	-	-	-	-	-	-	21.3	19.2	17.1	Significant headroom (>5 dB) at all wind speeds
Mid Guith	NSR4	No	-	-	-	-	-	17.1	18.4	16.3	14.2	Significant headroom (>5 dB) at all wind speeds
Benstonhall	NSR5	No	-	-	8.9	9.0	9.3	9.9	11.2	9.1	7.0	Significant headroom (>5 dB) at all wind speeds
Bredakirk	NSR6	Yes	-	-	-	-	-	-	20.2	18.1	16.0	Significant headroom (>5 dB) at all wind speeds
Shoehall	NSR7	No	-	-	9.8	9.9	10.2	10.8	12.1	10.0	7.9	Significant headroom (>5 dB) at all wind speeds
Newark	NSR8	Yes	-	-	-	-	-	-	19.5	17.4	15.3	Significant headroom (>5 dB) at all wind speeds
Fers Ness	NSR9	Yes	-	-	-	-	-	-	-	-	-	No cumulative effects
High Hill	NSR10	No	-	-	-	-	-	-	-	-	-	No cumulative effects
STAGE 4 – Where significant headroom is determined to be present, a cautious prediction (including a +2 dB correction) of cumulative noise is made.												
			Cautious prediction, dB (predicted level +2 dB) at NSRs/wind speeds where potential cumulative effects identified.									
Crowber	NSR1	No	-	-	-	-	28.0	30.1	32.2	34.3	36.4	
Lesshamar	NSR2	No	-	-	-	-	-	-	27.0	29.1	31.2	
North Guith	NSR3	No	-	-	-	-	-	-	27.1	29.2	31.3	
Mid Guith	NSR4	No	-	-	-	-	-	19.1	30.0	32.1	34.2	
Benstonhall	NSR5	No	-	-	28.8	30.9	33.0	35.0	35.0	39.3	41.4	Cautious predictions exceed noise limits of small turbines at 9 &10 m/s. Amended to 35 dB
Bredakirk	NSR6	Yes	-	-	-	-	-	-	28.2	30.3	32.4	
Shoehall	NSR7	No	-	-	27.9	30.0	32.1	34.2	35.0	38.4	40.5	Cautious predictions exceed noise limits of small turbines at 10 m/s. Amended to 35 dB
Newark	NSR8	Yes	-	-	-	-	-	-	28.9	31.0	33.1	
Fers Ness	NSR9	Yes	-	-	-	-	-	-	-	-	-	No cumulative effects

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
High Hill	NSR10	No	-	-	-	-	-	-	-	-	-	No cumulative effects
STAGE 5 – Determination of the applicable RNL. **At wind speeds where no cumulative effects identified, the RNL = the ONL.** **At wind speeds where cumulative effects could occur and significant headroom is available, the RNL = ONL minus the simplified ETSU noise limit (35 dB)** **At wind speeds where cumulative effects could occur and significant headroom is available, but simply subtracting the simplified ETSU noise limit would be overly and unnecessarily restrictive, the RNL = ONL minus the cautious prediction of cumulative turbine noise.**												
			Derivation of Residual Noise Limit (RNL) applicable to Proposed Development from ONL ONL = no cumulative effects therefore ONL applies ONL-35 = potential cumulative effects but significant headroom available, ONL minus logarithmic subtraction of 35 dB simplified ETSU limit applies ONL-CP = potential cumulative effects but significant headroom available, ONL minus logarithmic subtraction of 35 dB simplified ETSU limit is overly restrictive (substantially less than 35 dB or no existing limit applies; small turbines >10 m/s), therefore ONL minus logarithmic subtraction of Cautious Prediction applies.									
Crowber	NSR1	No	ONL	ONL	ONL	ONL	ONL-35	ONL-35	ONL-35	ONL-CP	ONL-CP	
Lesshamar	NSR2	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL-35	ONL-CP	ONL-CP	
North Guith	NSR3	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL-35	ONL-CP	ONL-CP	
Mid Guith	NSR4	No	ONL	ONL	ONL	ONL	ONL-35	ONL-35	ONL-35	ONL-CP	ONL-CP	
Benstonhall	NSR5	No	ONL	ONL	ONL-CP	ONL-CP	ONL-35	ONL-35	ONL-35	ONL-CP	ONL-CP	
Bredakirk	NSR6	Yes	ONL	ONL	ONL	ONL	ONL	ONL	ONL-35	ONL-CP	ONL-CP	
Shoehall	NSR7	No	ONL	ONL	ONL-CP	ONL-CP	ONL-35	ONL-35	ONL-35	ONL-CP	ONL-CP	
Newark	NSR8	Yes	ONL	ONL	ONL	ONL	ONL	ONL	ONL-35	ONL-CP	ONL-CP	
Fers Ness	NSR9	Yes	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
High Hill	NSR10	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
Stage 6 – RNL numerical values												
			Residual Noise Limit applicable to the Proposed Development, dBL$_{A90,10min}$									
Crowber	NSR1	No	35.0	35.0	35.7	37.9	38.7	42.3	46.1	46.1	45.9	
Lesshamar	NSR2	No	35.0	35.0	35.7	37.9	40.3	43.0	46.1	46.3	46.3	
North Guith	NSR3	No	35.0	35.0	35.7	37.9	40.3	43.0	46.1	46.3	46.3	

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
Mid Guith	NSR4	No	35.0	35.0	35.7	37.9	38.7	42.3	46.1	46.2	46.1	
Benstonhall	NSR5	No	35.0	35.0	34.7	36.9	38.7	42.3	46.1	45.5	44.7	
Bredakirk	NSR6	Yes	35.0	35.0	35.7	37.9	40.3	45.0	46.3	46.3	45.7	
Shoehall	NSR7	No	35.0	35.0	34.9	37.1	38.7	42.3	46.1	45.6	44.4	
Newark	NSR8	Yes	35.0	35.0	35.7	37.9	46.7	48.2	48.9	46.3	45.7	
Fers Ness	NSR9	Yes	38.3	40.3	42.5	44.7	46.7	48.2	49.0	49.0	49.0	
High Hill	NSR10	No	38.3	40.3	42.5	44.7	46.7	48.2	49.0	49.0	49.0	
Stage 7 – Calculation of any potential cumulative noise effect at NSRs with their own turbine(s).												
			Determination of potential cumulative effect at NSRs with their own turbines; potential cumulative effects may arise where the predicted levels are <10 dB different. Predicted level from small turbines minus predicted level from proposed development, dB									
Bredakirk	NSR6	Yes	-0.7	-3.4	-5.0	-3.6	-1.5	0.7	2.8	4.9	7.0	Potential cumulative effects at all wind speeds
Newark	NSR8	Yes	2.3	-0.5	-2.1	-0.6	1.5	3.6	5.7	7.8	**10.0**	Potential cumulative effects at 4 – 11 m/s. No cumulative effect at 12 m/s
Fers Ness	NSR9	Yes	-1.0	-3.8	-5.4	-3.9	-1.8	0.3	2.4	4.5	6.6	Potential cumulative effects at all wind speeds
Stage 8 – At wind speeds where potential cumulative effects identified, derivation of a Financially-Involved (FI) RNL by subtraction of cautious prediction of cumulative turbine noise (not including Proposed Development)												
			FI ONL minus cautious prediction of all small turbines (including turbines owned by NSR) FI RNL, dB									
Bredakirk	NSR6	Yes	44.9	44.9	44.8	44.6	44.4	43.9	45.1	44.0	41.3	
Newark	NSR8	Yes	44.9	44.8	44.6	44.4	44.0	43.2	44.2	41.9	-	Note – no cumulative effect at 12 m/s
Fers Ness	NSR9	Yes	44.9	44.9	44.9	44.8	46.4	47.9	48.6	48.3	47.8	
Stage 9 – Resultant RNL at NSRs with their own turbine(s)												
			RNL applicable at NSRs with own turbines; the lower of the RNL and the FI RNL, dB									
Bredakirk	NSR6	Yes	35.0	35.0	35.7	37.9	40.3	43.9	45.1	44.0	41.3	
Newark	NSR8	Yes	35.0	35.0	35.7	37.9	44.0	43.2	44.2	41.9	45.7	

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
Fers Ness	NSR9	Yes	38.3	40.3	42.5	44.7	46.4	47.9	48.6	48.3	47.8	

Night-time period

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
STAGE 1 – Determine the existing noise level at each NSR arising from cumulative turbines. At NSRs which have their own turbine(s) and may therefore be considered to have Financially Involved (FI) noise limits applicable to their own turbine(s), predicted noise levels exclude noise from their turbine(s).												
			Predicted level from small turbines, dBL_{A90}									
Crowber	NSR1	No	17.6	19.7	21.8	23.9	26.0	28.1	30.2	32.3	34.4	
Lesshamar	NSR2	No	12.4	14.5	16.6	18.7	20.8	22.9	25.0	27.1	29.2	
North Guith	NSR3	No	12.5	14.6	16.7	18.8	20.9	23.0	25.1	27.2	29.3	
Mid Guith	NSR4	No	15.4	17.5	19.6	21.7	23.8	25.9	28.0	30.1	32.2	
Benstonhall	NSR5	No	22.6	24.7	26.8	28.9	31.0	33.1	35.2	37.3	39.4	
Bredakirk	NSR6	Yes	13.6	15.7	17.8	19.9	22.0	24.1	26.2	28.3	30.4	
Shoehall	NSR7	No	21.7	23.8	25.9	28.0	30.1	32.2	34.3	36.4	38.5	
Newark	NSR8	Yes	14.3	16.4	18.5	20.6	22.7	24.8	26.9	29.0	31.1	
Fers Ness	NSR9	Yes	0.0	0.0	0.0	1.5	3.6	5.7	7.8	9.9	12.0	
High Hill	NSR10	No	3.6	5.7	7.8	9.9	12.0	14.1	16.2	18.3	20.4	
STAGE 2 – Where the predicted level from cumulative turbines is ≥10 dB below the 35 dB simplified ETSU limit, no significant cumulative effects with the Proposed Development will occur.												
			Predicted level from small turbines ≥10 dB below simplified ETSU limit/FI limit (where applicable)? Where TRUE the Proposed Development can meet simplified ETSU 35 dB limit without cumulative noise causing exceedance. Where FALSE predicted level from small turbines is within 10 dB of simplified ETSU noise limit and cumulative effects may occur. Note: simplified ETSU limit in planning conditions only covers up to 10 m/s wind speed.									
Crowber	NSR1	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	
Lesshamar	NSR2	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
North Guith	NSR3	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
Mid Guith	NSR4	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
Benstonhall	NSR5	No	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
Bredakirk	NSR6	Yes	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
Shoehall	NSR7	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	
Newark	NSR8	Yes	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
Fers Ness	NSR9	Yes	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
High Hill	NSR10	No	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	
STAGE 3 – At wind speeds at which potential cumulative effects may occur, the predicted cumulative level (excluding noise from the Proposed Development and noise from FI turbines at NSRs which are FI with those turbines, the presence of significant headroom (>5 dB) is determined.												
			At wind speeds where potential cumulative effects identified, comparison of predicted noise level from small turbines with derived Overall Noise Limit (ONL). **Noise limit minus predicted level, dB**									
Crowber	NSR1	No	-	-	-	-	-	-	-	-	8.6	
Lesshamar	NSR2	No	-	-	-	-	-	-	-	-	-	
North Guith	NSR3	No	-	-	-	-	-	-	-	-	-	
Mid Guith	NSR4	No	-	-	-	-	-	-	-	-	-	
Benstonhall	NSR5	No	-	-	-	-	-	12.2	10.7	8.6	6.5	
Bredakirk	NSR6	Yes	-	-	-	-	-	-	-	-	-	
Shoehall	NSR7	No	-	-	-	-	-	-	11.6	9.5	7.4	
Newark	NSR8	Yes	-	-	-	-	-	-	-	-	-	
Fers Ness	NSR9	Yes	-	-	-	-	-	-	-	-	-	
High Hill	NSR10	No	-	-	-	-	-	-	-	-	-	

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
STAGE 4 – Where significant headroom is determined to be present, a cautious prediction (including a +2 dB correction) of cumulative noise is made.												
			Cautious prediction, dB (predicted level +2 dB) at NSRs/wind speeds where potential cumulative effects identified.									
Crowber	NSR1	No	-	-	-	-	-	-	-	-	36.4	
Lesshamar	NSR2	No	-	-	-	-	-	-	-	-	-	
North Guith	NSR3	No	-	-	-	-	-	-	-	-	-	
Mid Guith	NSR4	No	-	-	-	-	-	-	-	-	-	
Benstonhall	NSR5	No	-	-	-	-	-	**35.0**	**35.0**	39.3	41.4	Cautious predictions exceed noise limits of small turbines. Amended to 35 dB where this occurs (**bold**).
Bredakirk	NSR6	Yes	-	-	-	-	-	-	-	-	-	
Shoehall	NSR7	No	-	-	-	-	-	-	36.3	38.4	40.5	Cautious predictions exceed noise limits of small turbines. Amended to 35 dB where this occurs (**bold**).
Newark	NSR8	Yes	-	-	-	-	-	-	-	-	-	
Fers Ness	NSR9	Yes	-	-	-	-	-	-	-	-	-	
High Hill	NSR10	No	-	-	-	-	-	-	-	-	-	
STAGE 5 – Determination of the applicable RNL. **At wind speeds where no cumulative effects identified, the RNL = the ONL.** **At wind speeds where cumulative effects could occur and significant headroom is available, the RNL = ONL minus the simplified ETSU noise limit (35 dB)** **At wind speeds where cumulative effects could occur and significant headroom is available, but simply subtracting the simplified ETSU noise limit would be overly and unnecessarily restrictive, the RNL = ONL minus the cautious prediction of cumulative turbine noise.**												
			Derivation of Residual Noise Limit (RNL) applicable to Proposed Development from ONL ONL = no cumulative effects therefore ONL applies ONL-35 = potential cumulative effects but significant headroom available, ONL minus logarithmic subtraction of 35 dB simplified ETSU limit applies ONL-CP = potential cumulative effects but significant headroom available, ONL minus logarithmic subtraction of 35 dB simplified ETSU limit is overly restrictive (substantially less than 35 dB or no existing limit applies; small turbines >10 m/s), therefore ONL minus logarithmic subtraction of Cautious Prediction applies.									
Crowber	NSR1	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL-CP	
Lesshamar	NSR2	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
North Guith	NSR3	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
Mid Guith	NSR4	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
Benstonhall	NSR5	No	ONL	ONL	ONL	ONL	ONL	ONL-35	ONL-35	ONL-CP	ONL-CP	
Bredakirk	NSR6	Yes	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
Shoehall	NSR7	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL-35	ONL-CP	ONL-CP	
Newark	NSR8	Yes	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
Fers Ness	NSR9	Yes	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
High Hill	NSR10	No	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	ONL	
Stage 6 – RNL numerical values												
			Residual Noise Limit applicable to the Proposed Development, $dBL_{A90,10min}$									
Crowber	NSR1	No	43.0	43.0	43.0	43.0	43.0	45.3	45.9	45.9	45.4	
Lesshamar	NSR2	No	43.0	43.0	43.0	43.0	43.0	45.3	45.9	45.9	45.9	
North Guith	NSR3	No	43.0	43.0	43.0	43.0	43.0	45.3	45.9	45.9	45.9	
Mid Guith	NSR4	No	43.0	43.0	43.0	43.0	43.0	45.3	45.9	45.9	45.9	
Benstonhall	NSR5	No	43.0	43.0	43.0	43.0	43.0	44.9	45.5	44.8	44.0	
Bredakirk	NSR6	Yes	43.0	43.0	43.0	43.0	43.0	45.3	45.9	45.9	45.9	
Shoehall	NSR7	No	43.0	43.0	43.0	43.0	43.0	45.3	45.5	45.9	45.9	
Newark	NSR8	Yes	43.0	43.0	43.0	45.0	46.6	47.5	47.8	47.8	47.8	
Fers Ness	NSR9	Yes	43.0	43.0	43.0	44.5	46.6	47.5	47.8	47.8	47.8	
High Hill	NSR10	No	43.0	43.0	43.0	44.5	46.6	47.5	47.8	47.8	47.8	

NSR name	NSR ID	NSR has own turbine?	Wind Speed, m/s									
			4	5	6	7	8	9	10	11	12	Notes / commentary
Stage 7 – Calculation of any potential cumulative noise effect at NSRs with their own turbine(s).												
			Determination of potential cumulative effect at NSRs with their own turbines; potential cumulative effects may arise where the predicted levels are <10 dB different. Predicted level from small turbines minus predicted level from proposed development, dB									
Bredakirk	NSR6	Yes	-0.7	-3.4	-5.0	-3.6	-1.5	0.7	2.8	4.9	7.0	Potential cumulative effects at all wind speeds
Newark	NSR8	Yes	2.3	-0.5	-2.1	-0.6	1.5	3.6	5.7	7.8	**10.0**	Potential cumulative effects at 4 – 11 m/s. No cumulative effect at 12 m/s
Fers Ness	NSR9	Yes	-1.0	-3.8	-5.4	-3.9	-1.8	0.3	2.4	4.5	6.6	Potential cumulative effects at all wind speeds
Stage 8 – At wind speeds where potential cumulative effects identified, derivation of a Financially-Involved (FI) RNL by subtraction of cautious prediction of cumulative turbine noise (not including Proposed Development)												
			FI ONL minus cautious prediction of all small turbines (including turbines owned by NSR) FI RNL, dB									
Bredakirk	NSR6	Yes	44.9	44.9	44.8	44.6	44.4	44.3	44.4	43.1	39.4	
Newark	NSR8	Yes	44.9	44.8	44.6	44.4	44.0	43.6	43.3	40.3	-	Predicted cumulative level greater than FI limit at 12m/s, but predicted level from proposed development >10 dB below predicted level from cumulative turbines therefore no cumulative effect
Fers Ness	NSR9	Yes	44.9	44.9	44.9	44.8	46.3	47.2	47.2	46.8	46.1	
Stage 9 – Resultant RNL at NSRs with their own turbine(s)												
			RNL applicable at NSRs with own turbines; the lower of the RNL and the FI RNL, dB									
Bredakirk	NSR6	Yes	43.0	43.0	43.0	43.0	43.0	44.3	44.4	43.1	39.4	
Newark	NSR8	Yes	43.0	43.0	43.0	44.4	44.0	43.6	43.3	40.3	47.8	
Fers Ness	NSR9	Yes	43.0	43.0	43.0	44.5	46.3	47.2	47.2	46.8	46.1	