# Appendix 9.6 – Cumulative Developments

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# Appendix 9.6: Cumulative Noise Immission Levels

## *Introduction*

Table 9.6.1 shows the turbine coordinates used for the prediction of noise immission levels from each of the neighbouring wind farms under consideration, which when combined with the noise immission levels from the Proposed Development result in the cumulative or "overall" noise immission levels. Table 9.6.2 shows the turbine types installed or expected at each wind farm, together with their overall sound power levels at a wind speed of 8 m/s at 10 m height. The sound power levels shown include the uncertainties derived in each case as appropriate according to the guidance in the Institute of Acoustics Good Practice Guide.

**Table 9.6.1 – Turbine Coordinates for Noise Predictions**

| Turbine No. | Easting | Northing | Turbine No. | Easting | Northing |
|---|---|---|---|---|---|
| Douglas West | | | | | |
| T1 | 280331 | 633205 | T8 | 281769 | 632799 |
| T2 | 280690 | 633124 | T9 | 282110 | 632385 |
| T3 | 281111 | 633045 | T10 | 282170 | 631825 |
| T4 | 281331 | 631665 | T11 | 282490 | 632125 |
| T5 | 281577 | 631442 | T12 | 282296 | 632950 |
| T6 | 281651 | 633144 | T13 | 282570 | 632685 |
| T7 | 281771 | 631965 | | | |
| Dalquhandy | | | | | |
| T1 | 279674 | 634793 | T9 | 279037 | 633681 |
| T2 | 279808 | 634499 | T10 | 278802 | 633276 |
| T3 | 280025 | 634175 | T11 | 278448 | 633295 |
| T4 | 279988 | 633262 | T12 | 278908 | 632553 |
| T5 | 279635 | 633381 | T13 | 279320 | 632770 |
| T6 | 279513 | 633732 | T14 | 279794 | 632839 |
| T7 | 279308 | 634083 | T15 | 279162 | 632358 |
| T8 | 279255 | 634454 | | | |
| Poniel | | | | | |
| T1 | 284023 | 633331 | T3 | 284571 | 633461 |
| T2 | 284292 | 633389 | | | |
| Hagshaw Hill repowered | | | | | |
| T1 | 278749 | 629561 | T8 | 279327 | 630246 |
| T2 | 279149 | 629586 | T9 | 278976 | 630329 |
| T3 | 279760 | 629664 | T10 | 279546 | 630730 |
| T4 | 279042 | 629950 | T11 | 279242 | 630900 |
| T5 | 279595 | 630026 | T12 | 278864 | 630881 |

| Turbine No. | Easting | Northing | Turbine No. | Easting | Northing |
|---|---|---|---|---|---|
| T6 | 280015 | 630194 | T13 | 278604 | 631053 |
| T7 | 279831 | 630506 | T14 | 279590 | 631291 |
| Hagshaw Hill extension | | | | | |
| T1 | 280632 | 631203 | T11 | 278303 | 630782 |
| T2 | 280713 | 631008 | T12 | 278446 | 630647 |
| T3 | 280349 | 631109 | T13 | 278581 | 630517 |
| T4 | 280475 | 630920 | T14 | 278706 | 630374 |
| T5 | 279833 | 631159 | T15 | 278204 | 630513 |
| T6 | 280002 | 631085 | T16 | 278325 | 630378 |
| T7 | 280116 | 630949 | T17 | 278455 | 630248 |
| T8 | 280250 | 630825 | T18 | 278585 | 630118 |
| T9 | 280280 | 630629 | T19 | 280355 | 630462 |
| T10 | 278696 | 629927 | T20 | 280519 | 630732 |
| Nutberry | | | | | |
| T1 | 276936 | 633340 | T4 | 277320 | 632610 |
| T2 | 277106 | 633118 | T5 | 277502 | 632403 |
| T3 | 277232 | 632877 | T6 | 277687 | 632194 |
| Cumberhead | | | | | |
| T1 | 274565 | 631923 | T8 | 276367 | 632904 |
| T2 | 274776 | 632370 | T9 | 276392 | 632270 |
| T3 | 275158 | 631862 | T10 | 276193 | 633804 |
| T4 | 275804 | 632626 | T11 | 278675 | 631621 |
| T5 | 275175 | 632769 | T12 | 276731 | 632693 |
| T6 | 278733 | 632056 | T13 | 278292 | 632443 |
| T7 | 275859 | 632204 | T14 | 278205 | 632004 |
| Galawhistle | | | | | |
| T1 | 278151 | 629564 | T12 | 276312 | 630336 |
| T2 | 277848 | 629763 | T13 | 276764 | 630496 |
| T3 | 277809 | 630096 | T14 | 276386 | 630711 |
| T4 | 277815 | 630481 | T15 | 276502 | 631459 |
| T5 | 277746 | 630796 | T16 | 277178 | 631514 |
| T6 | 278060 | 630367 | T17 | 277449 | 631817 |
| T7 | 277702 | 631568 | T18 | 276764 | 631232 |
| T8 | 277330 | 630880 | T19 | 277608 | 631207 |
| T9 | 276623 | 629429 | T20 | 276879 | 630866 |
| T10 | 276386 | 629669 | T21 | 278173 | 631037 |
| T11 | 276480 | 630018 | | | |
| Hazelside | | | | | |

| Turbine No. | Easting | Northing | Turbine No. | Easting | Northing |
|---|---|---|---|---|---|
| T1 | 281251 | 630930 | T2 | 281419 | 630803 |

**Table 9.6.2 – Turbine Details for Cumulative Noise Predictions**

| Wind Farm | no. of turbines | type | LwA at 8m/s* |
|---|---|---|---|
| Douglas West | 13 | Siemens SWT-3.6-130 | 108.0 |
| Dalquhandy | 15 | Senvion MM82 | 104.9 |
| Poniel | 3 | Enercon E-70 | 104.5 |
| Hagshaw Hill repowered | 14 | Siemens Gamesa SG3.4-132 | 108.2 |
| Hagshaw Hill extension | 20 | Siemens SWT-1.3-62 | 103.0 |
| Nutberry | 6 | Nordex N60 | 107.5 |
| Cumberhead | 14 | Vestas V90 | 109.0 |
| Galawhistle | 21 | Vestas V80 | 107.0 |
| Hazelside | 2 | Enercon E-48 | 101.5 |

* including uncertainty as defined by the IOA Good Practice Guide

Table 9.6.3 shows the calculated worst-case cumulative noise immission levels in terms of dB $L_{A90,10min}$ against the derived wind speed at 10m height for each of the 13 locations. The results are the worst-case levels from a broad brush approach to the recommendations of the IOA Good Practice Guide, and include 2dB of screening for any turbine not visible from the location in question. No allowance is made for directivity, and every turbine is treated as if it were directly upwind of the receptor.

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