EIAR VOLUME III
Appendices

CHAPTER 13 – NOISE AND VIBRATION

Appendix 13.1: Receptor Co-Ordinates

APPENDIX 13.1 – RECEPTOR CO-ORDINATES

Noise Model Receiver Co-ordinates (Ref. Volume IV, Figure 13.16)

Receiver	Baseline Group	Co-ordinates (ITM)		Notes
		X	Y	
1	BN2	548,288	607,048	Occupied Dwelling
2	BN3 (A)	549,083	606,395	Associated Dwelling
3	BN3 (A)	549,148	606,360	Associated Dwelling
4	BN3	549,525	606,575	Occupied Dwelling
5	BN3	549,553	606,594	Occupied Dwelling
6	BN3	549,591	606,614	Occupied Dwelling
7	BN3	550,055	606,401	Occupied Dwelling
7A	BN3	550,064	606,384	Unoccupied
8	BN3	550,123	606,406	Occupied Dwelling
9	BN3	550,079	606,358	Occupied Dwelling
10	BN3	550,089	606,337	Occupied Dwelling
11	BN3	550,107	606,306	Occupied Dwelling
12	BN3	550,103	606,272	Occupied Dwelling
13	BN3	550,153	606,151	Occupied Dwelling
14	BN3	550,299	606,026	Occupied Dwelling
15	BN3	550,338	605,860	Occupied Dwelling
16	BN3	550,430	605,806	Occupied Dwelling
17	BN3	550,316	605,654	Occupied Dwelling
18	BN4	550,468	604,986	Occupied Dwelling
19	BN4	550,410	604,977	Occupied Dwelling
20	BN4	550,409	604,915	Occupied Dwelling
21	BN4 (A)	550,065	604,751	Associated Dwelling
21A	BN4 - (A)	550,168	604,826	Associated Dwelling
22	BN4	549,946	604,567	Occupied Dwelling
23	BN4	549,855	604,650	Occupied Dwelling
24	BN4	549,895	604,578	Occupied Dwelling
24A	BN4 (P)	549,562	604,387	Planning Approved
25	BN4	549,825	604,530	Occupied Dwelling
25A	BN4	549,868	604,555	Occupied Dwelling
26	BN4	550,098	604,473	Occupied Dwelling
27	BN1	548,177	605,114	Occupied Dwelling
27A	BN1 (P)	548,270	605,018	Planning Approved
28	BN1	547,557	605,254	Occupied Dwelling
29	BN1	547,596	605,702	Occupied Dwelling
31	BN2	547,111	606,611	Occupied Dwelling
31A	BN2	547,086	606,661	Unoccupied
33	BN2	547,091	606,791	Occupied Dwelling
34	BN2	547,266	606,881	Occupied Dwelling

Receiver	Baseline Group	Co-ordinates (ITM)		Notes
		X	Y	
35	BN2	547,467	606,828	Occupied Dwelling
36	BN2	547,303	606,941	Occupied Dwelling
37	BN2	547,469	607,094	Occupied Dwelling
37A	BN2	547,502	607,086	Occupied Dwelling
38	BN2	547,557	607,114	Occupied Dwelling
39	BN2	547,720	607,117	Occupied Dwelling
40	BN2	547,758	607,112	Occupied Dwelling
41	BN2	547,812	607,137	Occupied Dwelling
42	BN2	547,843	607,173	Occupied Dwelling
43	BN2	548,386	607,423	Occupied Dwelling
44	BN2	548,357	607,975	Occupied Dwelling
45	BN2	548,426	608,110	Occupied Dwelling
46	BN2	548,430	608,133	Occupied Dwelling
47	BN2	548,435	608,192	Occupied Dwelling
54	BN3	549,098	608,095	Occupied Dwelling
55	BN3	549,082	608,042	Occupied Dwelling
55A	BN3 (P)	549,088	608,022	Planning Approved
56	BN3	549,120	608,062	Occupied Dwelling
57	BN3	549,141	608,042	School
58	BN3	549,111	607,998	Occupied Dwelling
59	BN3	549,136	607,963	Unoccupied
60	BN3	549,148	607,931	Occupied Dwelling
61	BN3	549,166	607,909	Occupied Dwelling
62	BN3	549,189	607,885	Occupied Dwelling
63	BN3	549,211	607,870	Occupied Dwelling
64	BN3	549,239	607,851	Occupied Dwelling
65	BN3	549,471	607,454	Occupied Dwelling
66	BN3	549,533	607,343	Occupied Dwelling
67	BN3	549,640	607,224	Occupied Dwelling
68	BN3	549,601	607,200	Occupied Dwelling
69	BN3	549,715	607,130	Occupied Dwelling
70	BN3	549,684	607,043	Occupied Dwelling
71	BN3	549,731	606,940	Occupied Dwelling
72	BN3	549,473	606,714	Occupied Dwelling
73	BN3	550,014	606,596	Occupied Dwelling
74	BN3	550,096	606,811	Occupied Dwelling
75	BN3	550,158	606,848	Occupied Dwelling
77	BN3	550,572	606,989	Occupied Dwelling
78	BN3	550,671	607,061	Occupied Dwelling
79	BN3	550,718	607,062	Occupied Dwelling
80	BN3	550,774	607,029	Occupied Dwelling
81	BN3	550,779	607,178	Occupied Dwelling
82	BN3	550,914	606,995	Occupied Dwelling

Receiver	Baseline Group	Co-ordinates (ITM)		Notes
		X	Y	
83	BN3	550,950	607,005	Occupied Dwelling
84	BN3	551,406	605,867	Occupied Dwelling
85	BN3	551,634	605,784	Occupied Dwelling
86	BN4	551,411	605,449	Occupied Dwelling
87	BN4	551,249	605,331	Occupied Dwelling
87A	BN4	551,198	605,300	Unoccupied
88	BN4	551,176	605,271	Occupied Dwelling
89	BN4	551,151	605,260	Occupied Dwelling
90	BN4	551,060	605,218	Occupied Dwelling
91	BN4	550,774	605,109	Occupied Dwelling
92	BN4	550,733	605,074	Occupied Dwelling
93	BN4	550,620	604,825	Occupied Dwelling
93A	BN4	550,593	604,690	Occupied Dwelling
94	BN4	551,144	604,701	Occupied Dwelling
95	BN4	551,198	604,693	Occupied Dwelling
97	BN4	551,327	604,572	Occupied Dwelling
98	BN4	551,318	604,470	Occupied Dwelling
99	BN4	551,429	604,448	Occupied Dwelling
100	BN4	550,673	603,653	Occupied Dwelling
101	BN4	550,588	603,575	Occupied Dwelling
102	BN4	550,439	603,537	Occupied Dwelling
103	BN4	550,348	603,388	Occupied Dwelling
104	BN4	550,253	603,394	Occupied Dwelling
106	BN4	549,470	603,296	Occupied Dwelling
107	BN4	549,353	603,344	Occupied Dwelling
108	BN4	549,162	603,934	Occupied Dwelling
109	BN4	549,129	604,104	Occupied Dwelling
110	BN1	548,827	604,138	Occupied Dwelling
111	BN1	548,754	604,061	Occupied Dwelling
112	BN1	548,734	604,064	Occupied Dwelling
113	BN1	548,709	604,078	Occupied Dwelling
114	BN1	548,679	604,083	Occupied Dwelling
115	BN4	548,748	603,336	Unoccupied
116	BN4	548,716	603,323	Occupied Dwelling
116A	BN4	548,703	603,328	Occupied Dwelling
117	BN4	548,688	603,394	Occupied Dwelling
118	BN4	548,692	603,316	Occupied Dwelling
119	BN4	548,662	603,309	Occupied Dwelling
120	BN4	548,638	603,302	Occupied Dwelling
121	BN4	548,624	603,346	Occupied Dwelling
121A	BN4 (P)	548,654	603,349	Planning Approved
122	BN4	548,592	603,335	Occupied Dwelling
123	BN4 (P)	548,612	603,297	Planning Approved

Receiver	Baseline Group	Co-ordinates (ITM)		Notes
		X	Y	
124	BN4	548,612	603,266	Occupied Dwelling
127	BN1	548,539	604,186	Occupied Dwelling
128	BN1	548,462	604,087	Occupied Dwelling
129	BN1	548,250	604,401	Occupied Dwelling
130	BN1	548,135	604,102	Occupied Dwelling
131	BN1	548,131	604,156	Occupied Dwelling
132	BN1	548,030	604,188	Occupied Dwelling
133	BN1	547,970	604,150	Occupied Dwelling
136	BN1	548,003	604,480	Occupied Dwelling
137	BN1	547,875	604,323	Occupied Dwelling
138	BN1	547,799	604,319	Occupied Dwelling
139	BN1	547,630	604,335	Occupied Dwelling
140	BN1	547,431	604,281	Occupied Dwelling
141	BN1	547,422	604,301	Occupied Dwelling
142	BN1	547,343	604,374	Occupied Dwelling
143	BN1	547,357	604,515	Occupied Dwelling
144	BN1	546,923	604,410	Occupied Dwelling
145	BN1	546,762	604,583	Occupied Dwelling
146	BN1	547,373	604,917	Occupied Dwelling
147	BN1	547,245	605,170	Occupied Dwelling
148	BN1	547,071	605,602	Occupied Dwelling
149	BN1	546,380	605,545	Occupied Dwelling
150	BN2	546,884	606,435	Occupied Dwelling
151	BN2	546,221	606,823	Occupied Dwelling
152	BN2	546,572	606,946	Occupied Dwelling
153	BN2	546,621	606,942	Occupied Dwelling
154	BN2	546,693	606,998	Occupied Dwelling
155	BN2	546,901	606,888	Occupied Dwelling
156	BN2	546,959	606,837	Occupied Dwelling
157	BN2	547,166	607,807	Occupied Dwelling
157A	BN2 (P)	547,174	607,843	Planning Approved
158	BN2	547,484	608,197	Occupied Dwelling
159	BN2	547,958	607,441	Unoccupied

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CHAPTER 13 – NOISE AND VIBRATION

Appendix 13.2: Potential Special Characteristics of Turbine Noise

APPENDIX 13.2 – POTENTIAL SPECIAL CHARACTERISTICS OF TURBINE NOISE

Potential special sound characteristics of turbine noise, such as Infrasound, Low Frequency Noise, Amplitude Modulation and Tonality, are discussed below. These characteristics are rare and are not factors that can be foreseen at Planning stage, but their presence can be measured and rated, typically in the event of a complaint, post construction.

It is therefore standard practice for special sound characteristics to be investigated, only in the event of complaint, and, where the investigation verifies their presence, mitigation measures put in place to address any identified significant negative turbine noise characteristics.

Infrasound/low frequency noise

Low Frequency Noise is noise that is dominated by frequency components less than approximately 200Hz whereas Infrasound is typically described as sound at frequencies below 20Hz. In relation to Infrasound, the following extract from the EPA document *Guidance Note for Noise Assessment of Wind Turbine Operations at EPA Licensed Sites* (NG3) (EPA, 2011) is reproduced:

> *"There is similarly no significant infrasound from wind turbines. Infrasound is high level sound at frequencies below 20 Hz. This was a prominent feature of passive yaw "downwind" turbines where the blades were positioned downwind of the tower which resulted in a characteristic "thump" as each blade passed through the wake caused by the turbine tower. With modern active yaw turbines (i.e., the blades are upwind of the tower and the turbine is turned to face into the wind by a wind direction sensor on the nacelle activating a yaw motor) this is no longer a significant feature."*

In 2010, the UK Health Protection Agency published a report entitled Health Effects of Exposure to Ultrasound and Infrasound, Report of the independent Advisory Group on Non-ionising Radiation. The exposures considered in the report related to medical applications and general environmental exposure. The report notes:

> *"Infrasound is widespread in modern society, being generated by cars, trains and aircraft, and by industrial machinery, pumps, compressors and low speed fans. Under these circumstances, infrasound is usually accompanied by the generation of audible, low frequency noise. Natural sources of infrasound include thunderstorms and fluctuations in atmospheric pressure, wind and waves, and volcanoes; running and swimming also generate changes in air pressure at infrasonic frequencies.*
>
> *For infrasound, aural pain and damage can occur at exposures above about 140 dB, the threshold depending on the frequency. The best-established responses occur following acute exposures at intensities great enough to be heard and may possibly lead to a decrease in wakefulness. The available evidence is inadequate to draw firm conclusions about potential health effects associated with exposure at the levels normally experienced in the environment, especially the effects of long-term exposures. The available data do not suggest that exposure to infrasound below the hearing threshold levels is capable of causing adverse effects."*
>
> The UK Institute of Acoustics Bulletin in March 2009 included a statement of agreement between acoustic consultants regularly employed on behalf of wind farm developers, and

conversely acoustic consultants regularly employed on behalf of community groups campaigning against wind farm developments (IAO JS2009). The intent of the article was to promote consistent assessment practices, and to assist in restricting wind farm noise disputes to legitimate matters of concern. On the subject of infrasound, the article notes:

"Infrasound is the term generally used to describe sound at frequencies below 20 Hz. At separation distances from wind turbines which are typical of residential locations the levels of infrasound from wind turbines are well below the human perception level. Infrasound from wind turbines is often at levels below that of the noise generated by wind around buildings and other obstacles.

Sounds at frequencies from about 20 Hz to 200 Hz are conventionally referred to as low-frequency sounds. A report for the DTI [The Department of Trade and Industry] in 2006 by Hayes McKenzie concluded that neither infrasound nor low frequency noise was a significant factor at the separation distances at which people lived. This was confirmed by a peer review by a number of consultants working in this field. We concur with this view."

The article concludes that:

> *"from examination of reports of the studies referred to above, and other reports widely available on internet sites, we conclude that there is no robust evidence that low frequency noise (including 'infrasound') or ground -borne vibration from wind farms, generally has adverse effects on wind farm neighbours".*

A report released in January 2013 by the South Australian Environment Protection Authority namely, *Infrasound levels near windfarms and in other environments (EPA, 2013)*[1] found that the level of infrasound from wind turbines is insignificant and no different to any other source of noise, and that the worst contributors to household infrasound are air-conditioners, traffic and noise generated by people.

The study included several houses in rural and urban areas, both adjacent to and away from a wind farm, and measured the levels of infrasound with the wind farms operating and switched off.

There were no noticeable differences in the levels of infrasound under all these different conditions. In fact, the lowest levels of infrasound were recorded at one of the houses closest to a wind farm, whereas the highest levels were found in an urban office building.

The EPA's study concluded that the level of infrasound at houses near wind turbines was no greater than in other urban and rural environments, and stated that:

> *"The contribution of wind turbines to the measured infrasound levels is insignificant in comparison with the background level of infrasound in the environment."*

In the unlikely event that an issue with low frequency noise is associated with the proposed development, it is recommended that an appropriate detailed investigation be undertaken. Due consideration should be given to guidance on conducting such an investigation which is outlined in Appendix VI of the EPA *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4) (EPA, 2016). This guidance is based on the threshold values outlined in the *Salford University document Procedure for the assessment of low frequency noise complaints, Revision 1, December 2011*.

[1] EPA South Australia, 2013, Wind farms https://www.epa.sa.gov.au/files/477912_infrasound.pdf

Amplitude Modulation (AM)

In Ireland, there is currently no fixed guidelines on the assessment of AM from wind farms. Amplitude Modulation (AM) is defined in the IoA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) document *A Method for Rating Amplitude Modulation in Wind Turbine Noise* (IoA, 2016) as:

> *"Periodic fluctuations in the level of audible noise from a wind turbine (or wind turbines), the frequency of the fluctuations being related to the blade passing frequency (BPF) of the turbine rotor(s)."*

It is now generally accepted that there are two mechanisms which can cause amplitude modulation:

- 'Normal' AM (NAM), and;
- 'Other' AM (OAM).

In both cases, the result is a regular fluctuation in amplitude at the Blade Passing Frequency (BPF) of the wind turbine blades (the rate at which the blades of the turbine pass a fixed point). For a three-bladed turbine rotating at 20 RPM, this equates to a modulation frequency of 1Hz. Both Normal and Other AM may be described as follows:

- 'Normal' AM: An observer at ground level close to a wind turbine will experience 'blade swish' because of the directional characteristics of the noise radiated from the trailing edge of the blades as it rotates towards and then away from the observer.

  This effect is reduced for an observer on or close to the turbine axis, and therefore would not generally be expected to be significant at typical separation distances, at least on relatively level sites.

  The RenewableUK AM project (RenewableUK, 2013) has coined the term 'normal' AM (NAM) for this inherent characteristic of wind turbine noise, which has long been recognised and was discussed in ETSU-R-97 in 1996.

- 'Other' AM: In some cases, AM is observed at large distances from a wind turbine (or turbines). The sound is generally heard as a periodic 'thumping' or 'whoomphing' at relatively low frequencies.

  On sites where it has been reported, occurrences appear to be occasional, although they can persist for several hours under some conditions, dependent on atmospheric factors, including wind speed and direction.

  It was proposed in the RenewableUK 2013 study that the fundamental cause of this type of AM is transient stall conditions occurring as the blades rotate, giving rise to the periodic thumping at the blade passing frequency.

  Transient stall represents a fundamentally different mechanism from blade swish and can be heard at relatively large distances, primarily downwind of the rotor blade.

  The RenewableUK AM project report adopted the term 'Other AM' (OAM) for this characteristic. The terms 'enhanced' or 'excess' AM (EAM) have been used by others, although such definitions do not distinguish between the source mechanisms and presuppose a 'normal' level of AM, presumably relating back to blade swish as described in ETSU-R-97.

Frequency of occurrence of AM

Research by Salford University commissioned by the Department of Environment Food and Rural Affairs (DEFRA), the Department of Business, Enterprise and Regulatory Reform (BERR) and the Department of Communities and Local Government (CLG) investigated the issue of AM associated with wind turbine noise. The results were reviewed and published in the report *Research into Aerodynamic Modulation of Wind Turbine Noise* (2007). The broad conclusions of this report were that aerodynamic modulation was only considered to be an issue at 4, and a possible issue at a further 8, of 133 sites in the UK that were operational at the time of the study and considered within the review. At the 4 sites where AM was confirmed as an issue, it was considered that conditions associated with AM might occur between about 7 and 15% of the time. It also emerged that for three out of the four sites the complaints have subsided, in one case due to the introduction of a turbine control system. The research has shown that AM is a rare and unlikely occurrence at operational wind farms.

It should be noted that AM is associated with wind turbine operation and it is not possible to predict an occurrence of AM at the planning stage. It should also be noted that it is a rare event associated with a limited number of wind farms. While it can occur, it is the exception rather than the rule.

RenewableUK Research Document[2] states the following in relation to matter:

Page 68 Module F: *"even on those limited sites where it has been reported, its frequency of occurrence appears to be at best infrequent and intermittent."*

Page 6 Module F: *"It has also been the experience of the project team that, even at those wind farm sites where AM has been reported or identified to be an issue, its occurrence may be relatively infrequent. Thus, the capture of time periods when subjectively significant AM occurs may involve elapsed periods of several weeks or even months."*

Page 8 Module F: *"There is nothing at the planning stage that can presently be used to indicate a positive likelihood of OAM occurring at any given proposed wind farm site, based either on the site's general characteristics or on the known characteristics of the wind turbines to be installed."*

Assessment of AM

Research and Guidance in the area is ongoing with recent publications being issued by the Institute of Acoustics (IoA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) namely, *A Method for Rating Amplitude Modulation in Wind Turbine Noise* (August 2016). The document proposes an objective method for measuring and rating AM. The AMWG does not propose what level of AM is likely to result in adverse community response.

In summary, research has shown that OAM is not something that is possible to foresee at planning stage, is infrequent (does not occur on every site), and when it does occur, does so under very specific wind conditions. OAM is therefore not a factor that can be foreseen at planning stage, but its presence can be measured and rated, typically in the event of a complaint, post construction. It is therefore standard practice for OAM to be investigated, only in the event of complaint, and, where the investigation verifies its presence, mitigation measures put in place to address the identified turbine OAM noise characteristics.

[2] *Wind Turbine Amplitude Modulation: Research to Improve Understanding as to its Cause and Effect*, December 2013.

Tonality

A tone may be defined as a concentration of acoustic energy into a very narrow frequency range, sometimes describes as a whine or humm. Where tones are found to be present a correction is added to the measured or predicted noise level before comparison with the recommended limits/criteria. The audibility of any tones is assessed by comparing the narrow band level of such tones with the masking level contained in a band of frequencies around the tone called the critical band.

The IoA GPG states the following in relation to tonality:

> *"Tonality*
>
> *4.2.7 It is highly unlikely that any specific information on tonality at representative receptor separation distances in accordance with the ETSU-R-97 methodology will be available at the planning application stage. When such information is available, it should be appropriately applied. It is standard to control the potential presence of tones in practice through the use of suitable planning conditions".*

The IoA GPG / ETSU-R-97 recommendations suggest a tone penalty which depends on the amount by which the tone exceeds the audibility threshold and should be included as part of the consent conditions.

At commissioning stage, it is proposed that tonal analysis be carried out, in accordance with the procedure outlined in Annex B, Guidance Note 3 of the IoA GPG. In the event that audible tones are found to be present at noise sensitive receptors, tonal penalties shall be applied to the measured data in accordance with the procedure outlined in the IoA GPG, with the rated noise level compared to the relevant noise limits approved by the Local Planning Authority.

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CHAPTER 13 – NOISE AND VIBRATION

Appendix 13.3: Assessment of predicted 'downwind' turbine noise levels against criteria

APPENDIX 13.3 – ASSESSMENT OF PREDICTED 'DOWNWIND' TURBINE NOISE LEVELS AGAINST CRITERIA

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
1	**Predicted**	24.2	25.2	28.6	33.6	37.3	38
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-13.3	-12.3	-8.9	-3.9	-0.2	-7.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.8	-17.8	-14.4	-9.4	-5.7	-5.0
2	**Predicted**	27.3	28.3	31.8	36.7	40.5	41.2
	Daytime Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Daytime Excess	-17.7	-16.7	-13.2	-8.3	-4.5	-3.8
	Night-time Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Night-time Excess	-17.7	-16.7	-13.2	-8.3	-4.5	-3.8
3	**Predicted**	27.4	28.4	31.8	36.8	40.5	41.2
	Daytime Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Daytime Excess	-17.6	-16.6	-13.2	-8.2	-4.5	-3.8
	Night-time Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Night-time Excess	-17.6	-16.6	-13.2	-8.2	-4.5	-3.8
4	**Predicted**	24.2	25.2	28.7	33.6	37.4	38.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-13.3	-12.3	-8.8	-3.9	-0.1	-6.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.8	-17.8	-14.3	-9.4	-5.6	-4.9
5	**Predicted**	24	25	28.4	33.4	37.1	37.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-13.5	-12.5	-9.1	-4.1	-0.4	-7.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.0	-18.0	-14.6	-9.6	-5.9	-5.2
6	**Predicted**	23.7	24.7	28.1	33.1	36.8	37.5
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Excess	-13.8	-12.8	-9.4	-4.4	-0.7	-7.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.3	-18.3	-14.9	-9.9	-6.2	-5.5
7	**Predicted**	23	24	27.4	32.4	36.1	36.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.5	-13.5	-10.1	-5.1	-1.4	-8.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.0	-19.0	-15.6	-10.6	-6.9	-6.2
7A	**Predicted**	23.1	24.1	27.5	32.5	36.2	36.9
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.4	-13.4	-10.0	-5.0	-1.3	-8.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.9	-18.9	-15.5	-10.5	-6.8	-6.1
8	**Predicted**	22.6	23.6	27	32	35.7	36.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.9	-13.9	-10.5	-5.5	-1.8	-8.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.4	-19.4	-16.0	-11.0	-7.3	-6.6
9	**Predicted**	23.1	24.1	27.6	32.6	36.3	37
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.4	-13.4	-9.9	-4.9	-1.2	-8.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.9	-18.9	-15.4	-10.4	-6.7	-6.0
10	**Predicted**	23.2	24.2	27.6	32.6	36.3	37
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.3	-13.3	-9.9	-4.9	-1.2	-8.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.8	-18.8	-15.4	-10.4	-6.7	-6.0
11	**Predicted**	23.3	24.3	27.7	32.7	36.4	37.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.2	-13.2	-9.8	-4.8	-1.1	-7.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.7	-18.7	-15.3	-10.3	-6.6	-5.9

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
12	**Predicted**	23.6	24.6	28	33	36.7	37.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-13.9	-12.9	-9.5	-4.5	-0.8	-7.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.4	-18.4	-15.0	-10.0	-6.3	-5.6
13	**Predicted**	24	25	28.4	33.4	37.1	37.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-13.5	-12.5	-9.1	-4.1	-0.4	-7.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.0	-18.0	-14.6	-9.6	-5.9	-5.2
14	**Predicted**	23.5	24.5	27.9	32.9	36.6	37.3
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.0	-13.0	-9.6	-4.6	-0.9	-7.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.5	-18.5	-15.1	-10.1	-6.4	-5.7
15	**Predicted**	23.9	24.9	28.4	33.3	37.1	37.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-13.6	-12.6	-9.1	-4.2	-0.4	-7.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.1	-18.1	-14.6	-9.7	-5.9	-5.2
16	**Predicted**	23.3	24.3	27.7	32.7	36.4	37.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.2	-13.2	-9.8	-4.8	-1.1	-7.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.7	-18.7	-15.3	-10.3	-6.6	-5.9
17	**Predicted**	24.9	25.9	29.3	34.3	38	38.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-12.6	-11.6	-8.2	-3.2	**0.5**	-6.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.1	-17.1	-13.7	-8.7	-5.0	-4.3
18	**Predicted**	22.8	23.8	27.2	32.2	35.9	36.6
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-14.7	-13.7	-17.8	-12.8	-9.1	-8.4

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.2	-19.2	-15.8	-10.8	-7.1	-6.4
19	**Predicted**	23.3	24.3	27.7	32.7	36.4	37.1
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-14.2	-13.2	-17.3	-12.3	-8.6	-7.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.7	-18.7	-15.3	-10.3	-6.6	-5.9
20	**Predicted**	23	24	27.5	32.4	36.2	36.9
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-14.5	-13.5	-17.5	-12.6	-8.8	-8.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.0	-19.0	-15.5	-10.6	-6.8	-6.1
21	**Predicted**	25.1	26.1	29.5	34.5	38.2	38.9
	Daytime Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Daytime Excess	-19.9	-18.9	-15.5	-10.5	-6.8	-6.1
	Night-time Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Night-time Excess	-19.9	-18.9	-15.5	-10.5	-6.8	-6.1
21A	**Predicted**	24.7	25.7	29.2	34.2	37.9	38.6
	Daytime Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Daytime Excess	-20.3	-19.3	-15.8	-10.8	-7.1	-6.4
	Night-time Criterion	45.0	45.0	45.0	45.0	45.0	45.0
	Night-time Excess	-20.3	-19.3	-15.8	-10.8	-7.1	-6.4
22	**Predicted**	24.4	25.3	28.8	33.8	37.5	38.2
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-13.1	-12.2	-16.2	-11.2	-7.5	-6.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.6	-17.7	-14.2	-9.2	-5.5	-4.8
23	**Predicted**	25.7	26.7	30.2	35.1	38.9	39.6
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-11.8	-10.8	-14.8	-9.9	-6.1	-5.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-17.3	-16.3	-12.8	-7.9	-4.1	-3.4
24	**Predicted**	24.8	25.8	29.2	34.2	37.9	38.6

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-12.7	-11.7	-15.8	-10.8	-7.1	-6.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.2	-17.2	-13.8	-8.8	-5.1	-4.4
24A	**Predicted**	24.4	25.4	28.8	33.8	37.5	38.2
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-13.1	-12.1	-16.2	-11.2	-7.5	-6.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.6	-17.6	-14.2	-9.2	-5.5	-4.8
25	**Predicted**	24.7	25.7	29.1	34.1	37.9	38.6
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-12.8	-11.8	-15.9	-10.9	-7.1	-6.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.3	-17.3	-13.9	-8.9	-5.1	-4.4
25A	**Predicted**	24.7	25.7	29.1	34.1	37.8	38.5
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-12.8	-11.8	-15.9	-10.9	-7.2	-6.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-18.3	-17.3	-13.9	-8.9	-5.2	-4.5
26	**Predicted**	22.7	23.7	27.1	32.1	35.8	36.5
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-14.8	-13.8	-17.9	-12.9	-9.2	-8.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.3	-19.3	-15.9	-10.9	-7.2	-6.5
27	**Predicted**	26.8	27.8	31.2	36.2	40	40.7
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-10.7	-9.7	-6.3	-1.3	-5.0	-4.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-16.2	-15.2	-11.8	-6.8	-3.0	-2.3
27A	**Predicted**	26.8	27.8	31.2	36.2	39.9	40.6
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-10.7	-9.7	-6.3	-1.3	-5.1	-4.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Excess	-16.2	-15.2	-11.8	-6.8	-3.1	-2.4
28	**Predicted**	23.2	24.2	27.6	32.6	36.3	37
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-14.3	-13.3	-9.9	-4.9	-8.7	-8.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.8	-18.8	-15.4	-10.4	-6.7	-6.0
29	**Predicted**	25.7	26.7	30.2	35.1	38.9	39.6
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-11.8	-10.8	-7.3	-2.4	-6.1	-5.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-17.3	-16.3	-12.8	-7.9	-4.1	-3.4
31	**Predicted**	21.3	22.3	25.8	30.7	34.5	35.2
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.2	-15.2	-11.7	-6.8	-3.0	-9.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.7	-20.7	-17.2	-12.3	-8.5	-7.8
31A	**Predicted**	21	22	25.4	30.4	34.1	34.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.5	-15.5	-12.1	-7.1	-3.4	-10.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.0	-21.0	-17.6	-12.6	-8.9	-8.2
33	**Predicted**	20.5	21.5	24.9	29.9	33.6	34.3
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.0	-16.0	-12.6	-7.6	-3.9	-10.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.5	-21.5	-18.1	-13.1	-9.4	-8.7
34	**Predicted**	21.4	22.4	25.8	30.8	34.5	35.2
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.1	-15.1	-11.7	-6.7	-3.0	-9.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.6	-20.6	-17.2	-12.2	-8.5	-7.8
35	**Predicted**	23.3	24.3	27.8	32.7	36.5	37.2
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Excess	-14.2	-13.2	-9.7	-4.8	-1.0	-7.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.7	-18.7	-15.2	-10.3	-6.5	-5.8
36	**Predicted**	21.3	22.3	25.7	30.7	34.4	35.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.2	-15.2	-11.8	-6.8	-3.1	-9.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.7	-20.7	-17.3	-12.3	-8.6	-7.9
37	**Predicted**	21.3	22.3	25.7	30.7	34.4	35.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.2	-15.2	-11.8	-6.8	-3.1	-9.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.7	-20.7	-17.3	-12.3	-8.6	-7.9
37A	**Predicted**	21.5	22.5	26	30.9	34.7	35.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.0	-15.0	-11.5	-6.6	-2.8	-9.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.5	-20.5	-17.0	-12.1	-8.3	-7.6
38	**Predicted**	21.6	22.6	26	31	34.7	35.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-15.9	-14.9	-11.5	-6.5	-2.8	-9.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.4	-20.4	-17.0	-12.0	-8.3	-7.6
39	**Predicted**	22.4	23.4	26.8	31.8	35.5	36.2
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-15.1	-14.1	-10.7	-5.7	-2.0	-8.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.6	-19.6	-16.2	-11.2	-7.5	-6.8
40	**Predicted**	22.6	23.6	27	32	35.7	36.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.9	-13.9	-10.5	-5.5	-1.8	-8.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.4	-19.4	-16.0	-11.0	-7.3	-6.6

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
41	**Predicted**	22.6	23.6	27	32	35.7	36.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-14.9	-13.9	-10.5	-5.5	-1.8	-8.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.4	-19.4	-16.0	-11.0	-7.3	-6.6
42	**Predicted**	22.3	23.3	26.7	31.7	35.4	36.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-15.2	-14.2	-10.8	-5.8	-2.1	-8.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.7	-19.7	-16.3	-11.3	-7.6	-6.9
43	**Predicted**	20.7	21.7	25.2	30.1	33.8	34.5
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.8	-15.8	-12.3	-7.4	-3.7	-10.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.3	-21.3	-17.8	-12.9	-9.2	-8.5
44	**Predicted**	17	18	21.4	26.4	30.1	30.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.5	-19.5	-16.1	-11.1	-7.4	-14.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.0	-25.0	-21.6	-16.6	-12.9	-12.2
45	**Predicted**	16.2	17.2	20.6	25.6	29.3	30
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.3	-20.3	-16.9	-11.9	-8.2	-15.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.8	-25.8	-22.4	-17.4	-13.7	-13.0
46	**Predicted**	16.1	17.1	20.5	25.5	29.2	29.9
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.4	-20.4	-17.0	-12.0	-8.3	-15.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.9	-25.9	-22.5	-17.5	-13.8	-13.1
47	**Predicted**	15.7	16.8	20.2	25.2	28.9	29.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.8	-20.7	-17.3	-12.3	-8.6	-15.4

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.3	-26.2	-22.8	-17.8	-14.1	-13.4
54	**Predicted**	15.9	16.9	20.3	25.3	29	29.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.6	-20.6	-17.2	-12.2	-8.5	-15.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.1	-26.1	-22.7	-17.7	-14.0	-13.3
55	**Predicted**	16.2	17.2	20.6	25.6	29.3	30
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.3	-20.3	-16.9	-11.9	-8.2	-15.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.8	-25.8	-22.4	-17.4	-13.7	-13.0
55A	**Predicted**	16.3	17.3	20.7	25.7	29.4	30.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.2	-20.2	-16.8	-11.8	-8.1	-14.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.7	-25.7	-22.3	-17.3	-13.6	-12.9
56	**Predicted**	16	17.1	20.5	25.5	29.2	29.9
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.5	-20.4	-17.0	-12.0	-8.3	-15.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.0	-25.9	-22.5	-17.5	-13.8	-13.1
57	**Predicted**	16.1	17.1	20.6	25.5	29.2	29.9
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.4	-20.4	-16.9	-12.0	-8.3	-15.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.9	-25.9	-22.4	-17.5	-13.8	-13.1
58	**Predicted**	16.4	17.4	20.8	25.8	29.5	30.2
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.1	-20.1	-16.7	-11.7	-8.0	-14.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.6	-25.6	-22.2	-17.2	-13.5	-12.8
59	**Predicted**	16.5	17.6	21	26	29.7	30.4

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.0	-19.9	-16.5	-11.5	-7.8	-14.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.5	-25.4	-22.0	-17.0	-13.3	-12.6
60	**Predicted**	16.7	17.7	21.1	26.1	29.8	30.5
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.8	-19.8	-16.4	-11.4	-7.7	-14.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.3	-25.3	-21.9	-16.9	-13.2	-12.5
61	**Predicted**	16.8	17.8	21.2	26.2	29.9	30.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.7	-19.7	-16.3	-11.3	-7.6	-14.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.2	-25.2	-21.8	-16.8	-13.1	-12.4
62	**Predicted**	16.9	17.9	21.3	26.3	30	30.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.6	-19.6	-16.2	-11.2	-7.5	-14.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.1	-25.1	-21.7	-16.7	-13.0	-12.3
63	**Predicted**	16.9	18	21.4	26.3	30.1	30.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.6	-19.5	-16.1	-11.2	-7.4	-14.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.1	-25.0	-21.6	-16.7	-12.9	-12.2
64	**Predicted**	17	18	21.4	26.4	30.1	30.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.5	-19.5	-16.1	-11.1	-7.4	-14.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.0	-25.0	-21.6	-16.6	-12.9	-12.2
65	**Predicted**	18.7	19.7	23.2	28.1	31.8	32.5
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-18.8	-17.8	-14.3	-9.4	-5.7	-12.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Excess	-24.3	-23.3	-19.8	-14.9	-11.2	-10.5
66	**Predicted**	19.2	20.2	23.6	28.6	32.3	33
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-18.3	-17.3	-13.9	-8.9	-5.2	-12.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.8	-22.8	-19.4	-14.4	-10.7	-10.0
67	**Predicted**	19.6	20.6	24	29	32.7	33.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.9	-16.9	-13.5	-8.5	-4.8	-11.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.4	-22.4	-19.0	-14.0	-10.3	-9.6
68	**Predicted**	19.8	20.8	24.3	29.2	32.9	33.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.7	-16.7	-13.2	-8.3	-4.6	-11.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.2	-22.2	-18.7	-13.8	-10.1	-9.4
69	**Predicted**	19.9	20.9	24.3	29.3	33	33.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.6	-16.6	-13.2	-8.2	-4.5	-11.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.1	-22.1	-18.7	-13.7	-10.0	-9.3
70	**Predicted**	20.5	21.5	24.9	29.9	33.6	34.3
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.0	-16.0	-12.6	-7.6	-3.9	-10.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.5	-21.5	-18.1	-13.1	-9.4	-8.7
71	**Predicted**	21	22	25.4	30.4	34.1	34.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-16.5	-15.5	-12.1	-7.1	-3.4	-10.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.0	-21.0	-17.6	-12.6	-8.9	-8.2
72	**Predicted**	23.4	24.4	27.8	32.8	36.5	37.2
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Excess	-14.1	-13.1	-9.7	-4.7	-1.0	-7.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-19.6	-18.6	-15.2	-10.2	-6.5	-5.8
73	**Predicted**	22	23	26.4	31.4	35.1	35.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-15.5	-14.5	-11.1	-6.1	-2.4	-9.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.0	-20.0	-16.6	-11.6	-7.9	-7.2
74	**Predicted**	20.3	21.3	24.7	29.7	33.4	34.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.2	-16.2	-12.8	-7.8	-4.1	-10.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.7	-21.7	-18.3	-13.3	-9.6	-8.9
75	**Predicted**	19.8	20.9	24.3	29.3	33	33.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.7	-16.6	-13.2	-8.2	-4.5	-11.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.2	-22.1	-18.7	-13.7	-10.0	-9.3
77	**Predicted**	17.4	18.5	21.9	26.8	30.5	31.2
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.1	-19.0	-15.6	-10.7	-7.0	-13.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-25.6	-24.5	-21.1	-16.2	-12.5	-11.8
78	**Predicted**	16.7	17.8	21.2	26.1	29.9	30.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.8	-19.7	-16.3	-11.4	-7.6	-14.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.3	-25.2	-21.8	-16.9	-13.1	-12.4
79	**Predicted**	16.5	17.6	21	25.9	29.7	30.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.0	-19.9	-16.5	-11.6	-7.8	-14.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.5	-25.4	-22.0	-17.1	-13.3	-12.6

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
80	**Predicted**	16.4	17.5	20.9	25.8	29.6	30.3
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.1	-20.0	-16.6	-11.7	-7.9	-14.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.6	-25.5	-22.1	-17.2	-13.4	-12.7
81	**Predicted**	15.9	16.9	20.3	25.3	29	29.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.6	-20.6	-17.2	-12.2	-8.5	-15.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.1	-26.1	-22.7	-17.7	-14.0	-13.3
82	**Predicted**	16	17	20.4	25.4	29.1	29.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.5	-20.5	-17.1	-12.1	-8.4	-15.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.0	-26.0	-22.6	-17.6	-13.9	-13.2
83	**Predicted**	15.8	16.8	20.2	25.2	28.9	29.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.7	-20.7	-17.3	-12.3	-8.6	-15.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.2	-26.2	-22.8	-17.8	-14.1	-13.4
84	**Predicted**	16.2	17.2	20.6	25.6	29.3	30
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.3	-20.3	-16.9	-11.9	-8.2	-15.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.8	-25.8	-22.4	-17.4	-13.7	-13.0
85	**Predicted**	15	16.1	19.5	24.5	28.2	28.9
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-22.5	-21.4	-18.0	-13.0	-9.3	-16.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-28.0	-26.9	-23.5	-18.5	-14.8	-14.1
86	**Predicted**	16.4	17.4	20.8	25.8	29.5	30.2
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.1	-20.1	-24.2	-19.2	-15.5	-14.8

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.6	-25.6	-22.2	-17.2	-13.5	-12.8
87	**Predicted**	17.4	18.4	21.8	26.8	30.5	31.2
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.1	-19.1	-23.2	-18.2	-14.5	-13.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-25.6	-24.6	-21.2	-16.2	-12.5	-11.8
87A	**Predicted**	17.7	18.7	22.1	27.1	30.8	31.5
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-19.8	-18.8	-22.9	-17.9	-14.2	-13.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-25.3	-24.3	-20.9	-15.9	-12.2	-11.5
88	**Predicted**	17.8	18.8	22.2	27.2	30.9	31.6
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-19.7	-18.7	-22.8	-17.8	-14.1	-13.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-25.2	-24.2	-20.8	-15.8	-12.1	-11.4
89	**Predicted**	18	19	22.4	27.4	31.1	31.8
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-19.5	-18.5	-22.6	-17.6	-13.9	-13.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-25.0	-24.0	-20.6	-15.6	-11.9	-11.2
90	**Predicted**	18.5	19.6	23	27.9	31.7	32.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-19.0	-17.9	-22.0	-17.1	-13.3	-12.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-24.5	-23.4	-20.0	-15.1	-11.3	-10.6
91	**Predicted**	20.5	21.5	24.9	29.9	33.6	34.3
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-17.0	-16.0	-20.1	-15.1	-11.4	-10.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.5	-21.5	-18.1	-13.1	-9.4	-8.7
92	**Predicted**	20.8	21.8	25.2	30.2	33.9	34.6

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-16.7	-15.7	-19.8	-14.8	-11.1	-10.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.2	-21.2	-17.8	-12.8	-9.1	-8.4
93	**Predicted**	20.9	22	25.4	30.4	34.1	34.8
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-16.6	-15.5	-19.6	-14.6	-10.9	-10.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.1	-21.0	-17.6	-12.6	-8.9	-8.2
93A	**Predicted**	20.6	21.6	25.1	30	33.7	34.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-16.9	-15.9	-19.9	-15.0	-11.3	-10.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.4	-21.4	-17.9	-13.0	-9.3	-8.6
94	**Predicted**	17	18	21.4	26.4	30.1	30.8
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.5	-19.5	-23.6	-18.6	-14.9	-14.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.0	-25.0	-21.6	-16.6	-12.9	-12.2
95	**Predicted**	16.7	17.7	21.2	26.1	29.8	30.5
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.8	-19.8	-23.8	-18.9	-15.2	-14.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.3	-25.3	-21.8	-16.9	-13.2	-12.5
97	**Predicted**	15.7	16.8	20.2	25.1	28.9	29.6
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.8	-20.7	-24.8	-19.9	-16.1	-15.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.3	-26.2	-22.8	-17.9	-14.1	-13.4
98	**Predicted**	15.5	16.6	20	25	28.7	29.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-22.0	-20.9	-25.0	-20.0	-16.3	-15.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Excess	-27.5	-26.4	-23.0	-18.0	-14.3	-13.6
99	**Predicted**	15	16	19.5	24.4	28.1	28.8
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-22.5	-21.5	-25.5	-20.6	-16.9	-16.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-28.0	-27.0	-23.5	-18.6	-14.9	-14.2
100	**Predicted**	15.6	16.7	20.1	25	28.8	29.5
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.9	-20.8	-24.9	-20.0	-16.2	-15.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.4	-26.3	-22.9	-18.0	-14.2	-13.5
101	**Predicted**	15.6	16.6	20	25	28.7	29.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.9	-20.9	-25.0	-20.0	-16.3	-15.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.4	-26.4	-23.0	-18.0	-14.3	-13.6
102	**Predicted**	15.8	16.9	20.3	25.3	29	29.7
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.7	-20.6	-24.7	-19.7	-16.0	-15.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.2	-26.1	-22.7	-17.7	-14.0	-13.3
103	**Predicted**	15.4	16.4	19.8	24.8	28.5	29.2
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-22.1	-21.1	-25.2	-20.2	-16.5	-15.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.6	-26.6	-23.2	-18.2	-14.5	-13.8
104	**Predicted**	15.7	16.7	20.1	25.1	28.8	29.5
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.8	-20.8	-24.9	-19.9	-16.2	-15.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.3	-26.3	-22.9	-17.9	-14.2	-13.5
106	**Predicted**	16.5	17.5	20.9	25.9	29.6	30.3
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Excess	-21.0	-20.0	-24.1	-19.1	-15.4	-14.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.5	-25.5	-22.1	-17.1	-13.4	-12.7
107	**Predicted**	16.8	17.8	21.2	26.2	29.9	30.6
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.7	-19.7	-23.8	-18.8	-15.1	-14.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.2	-25.2	-21.8	-16.8	-13.1	-12.4
108	**Predicted**	20.8	21.8	25.2	30.2	33.9	34.6
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-16.7	-15.7	-19.8	-14.8	-11.1	-10.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.2	-21.2	-17.8	-12.8	-9.1	-8.4
109	**Predicted**	22.2	23.2	26.6	31.6	35.3	36
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-15.3	-14.3	-18.4	-13.4	-9.7	-9.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.8	-19.8	-16.4	-11.4	-7.7	-7.0
110	**Predicted**	22.1	23.1	26.5	31.5	35.2	35.9
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-15.4	-14.4	-11.0	-6.0	-9.8	-9.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.9	-19.9	-16.5	-11.5	-7.8	-7.1
111	**Predicted**	21.3	22.4	25.8	30.8	34.5	35.2
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-16.2	-15.1	-11.7	-6.7	-10.5	-9.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.7	-20.6	-17.2	-12.2	-8.5	-7.8
112	**Predicted**	21.3	22.3	25.8	30.7	34.4	35.1
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-16.2	-15.2	-11.7	-6.8	-10.6	-9.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.7	-20.7	-17.2	-12.3	-8.6	-7.9

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
113	**Predicted**	21.4	22.4	25.8	30.8	34.5	35.2
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-16.1	-15.1	-11.7	-6.7	-10.5	-9.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.6	-20.6	-17.2	-12.2	-8.5	-7.8
114	**Predicted**	21.4	22.4	25.8	30.8	34.5	35.2
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-16.1	-15.1	-11.7	-6.7	-10.5	-9.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.6	-20.6	-17.2	-12.2	-8.5	-7.8
115	**Predicted**	16.6	17.7	21.1	26	29.8	30.5
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.9	-19.8	-23.9	-19.0	-15.2	-14.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.4	-25.3	-21.9	-17.0	-13.2	-12.5
116	**Predicted**	16.5	17.6	21	25.9	29.7	30.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.0	-19.9	-24.0	-19.1	-15.3	-14.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.5	-25.4	-22.0	-17.1	-13.3	-12.6
116A	**Predicted**	16.5	17.6	21	26	29.7	30.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.0	-19.9	-24.0	-19.0	-15.3	-14.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.5	-25.4	-22.0	-17.0	-13.3	-12.6
117	**Predicted**	16.9	17.9	21.3	26.3	30	30.7
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.6	-19.6	-23.7	-18.7	-15.0	-14.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.1	-25.1	-21.7	-16.7	-13.0	-12.3
118	**Predicted**	16.5	17.5	20.9	25.9	29.6	30.3
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.0	-20.0	-24.1	-19.1	-15.4	-14.7

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.5	-25.5	-22.1	-17.1	-13.4	-12.7
119	**Predicted**	16.4	17.4	20.8	25.8	29.5	30.2
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.1	-20.1	-24.2	-19.2	-15.5	-14.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.6	-25.6	-22.2	-17.2	-13.5	-12.8
120	**Predicted**	16.3	17.4	20.8	25.7	29.5	30.2
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.2	-20.1	-24.2	-19.3	-15.5	-14.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.7	-25.6	-22.2	-17.3	-13.5	-12.8
121	**Predicted**	16.6	17.6	21	26	29.7	30.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.9	-19.9	-24.0	-19.0	-15.3	-14.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.4	-25.4	-22.0	-17.0	-13.3	-12.6
121A	**Predicted**	16.6	17.6	21.1	26	29.7	30.4
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-20.9	-19.9	-23.9	-19.0	-15.3	-14.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.4	-25.4	-21.9	-17.0	-13.3	-12.6
122	**Predicted**	16.5	17.5	20.9	25.9	29.6	30.3
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.0	-20.0	-24.1	-19.1	-15.4	-14.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.5	-25.5	-22.1	-17.1	-13.4	-12.7
123	**Predicted**	16.3	17.3	20.7	25.7	29.4	30.1
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.2	-20.2	-24.3	-19.3	-15.6	-14.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.7	-25.7	-22.3	-17.3	-13.6	-12.9
124	**Predicted**	16.1	17.1	20.6	25.5	29.2	29.9

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Criterion	37.5	37.5	45.0	45.0	45.0	45.0
	Daytime Excess	-21.4	-20.4	-24.4	-19.5	-15.8	-15.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.9	-25.9	-22.4	-17.5	-13.8	-13.1
127	**Predicted**	21.7	22.8	26.2	31.2	34.9	35.6
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-15.8	-14.7	-11.3	-6.3	-10.1	-9.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.3	-20.2	-16.8	-11.8	-8.1	-7.4
128	**Predicted**	20.8	21.8	25.3	30.2	33.9	34.6
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-16.7	-15.7	-12.2	-7.3	-11.1	-10.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.2	-21.2	-17.7	-12.8	-9.1	-8.4
129	**Predicted**	22.2	23.2	26.6	31.6	35.3	36
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-15.3	-14.3	-10.9	-5.9	-9.7	-9.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-20.8	-19.8	-16.4	-11.4	-7.7	-7.0
130	**Predicted**	19.9	20.9	24.3	29.3	33	33.7
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-17.6	-16.6	-13.2	-8.2	-12.0	-11.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.1	-22.1	-18.7	-13.7	-10.0	-9.3
131	**Predicted**	20.2	21.2	24.6	29.6	33.3	34
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-17.3	-16.3	-12.9	-7.9	-11.7	-11.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.8	-21.8	-18.4	-13.4	-9.7	-9.0
132	**Predicted**	20	21	24.4	29.4	33.1	33.8
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-17.5	-16.5	-13.1	-8.1	-11.9	-11.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Excess	-23.0	-22.0	-18.6	-13.6	-9.9	-9.2
133	**Predicted**	19.6	20.6	24	29	32.7	33.4
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-17.9	-16.9	-13.5	-8.5	-12.3	-11.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.4	-22.4	-19.0	-14.0	-10.3	-9.6
136	**Predicted**	21.6	22.6	26	31	34.7	35.4
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-15.9	-14.9	-11.5	-6.5	-10.3	-9.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-21.4	-20.4	-17.0	-12.0	-8.3	-7.6
137	**Predicted**	20.1	21.1	24.6	29.5	33.2	33.9
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-17.4	-16.4	-12.9	-8.0	-11.8	-11.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.9	-21.9	-18.4	-13.5	-9.8	-9.1
138	**Predicted**	19.8	20.8	24.2	29.2	32.9	33.6
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-17.7	-16.7	-13.3	-8.3	-12.1	-11.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.2	-22.2	-18.8	-13.8	-10.1	-9.4
139	**Predicted**	19.1	20.2	23.6	28.6	32.3	33
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-18.4	-17.3	-13.9	-8.9	-12.7	-12.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.9	-22.8	-19.4	-14.4	-10.7	-10.0
140	**Predicted**	18.1	19.1	22.5	27.5	31.2	31.9
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-19.4	-18.4	-15.0	-10.0	-13.8	-13.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-24.9	-23.9	-20.5	-15.5	-11.8	-11.1
141	**Predicted**	18.1	19.1	22.5	27.5	31.2	31.9
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Daytime Excess	-19.4	-18.4	-15.0	-10.0	-13.8	-13.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-24.9	-23.9	-20.5	-15.5	-11.8	-11.1
142	**Predicted**	18.1	19.1	22.5	27.5	31.2	31.9
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-19.4	-18.4	-15.0	-10.0	-13.8	-13.1
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-24.9	-23.9	-20.5	-15.5	-11.8	-11.1
143	**Predicted**	18.7	19.7	23.2	28.1	31.8	32.5
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-18.8	-17.8	-14.3	-9.4	-13.2	-12.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-24.3	-23.3	-19.8	-14.9	-11.2	-10.5
144	**Predicted**	16.4	17.4	20.8	25.8	29.5	30.2
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-21.1	-20.1	-16.7	-11.7	-15.5	-14.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.6	-25.6	-22.2	-17.2	-13.5	-12.8
145	**Predicted**	16.2	17.2	20.7	25.6	29.3	30
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-21.3	-20.3	-16.8	-11.9	-15.7	-15.0
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.8	-25.8	-22.3	-17.4	-13.7	-13.0
146	**Predicted**	20.5	21.5	24.9	29.9	33.6	34.3
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-17.0	-16.0	-12.6	-7.6	-11.4	-10.7
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.5	-21.5	-18.1	-13.1	-9.4	-8.7
147	**Predicted**	20.7	21.7	25.1	30.1	33.8	34.5
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-16.8	-15.8	-12.4	-7.4	-11.2	-10.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.3	-21.3	-17.9	-12.9	-9.2	-8.5

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
148	**Predicted**	20.9	21.9	25.3	30.3	34	34.7
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-16.6	-15.6	-12.2	-7.2	-11.0	-10.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.1	-21.1	-17.7	-12.7	-9.0	-8.3
149	**Predicted**	16.3	17.4	20.8	25.8	29.5	30.2
	Daytime Criterion	37.5	37.5	37.5	37.5	45.0	45.0
	Daytime Excess	-21.2	-20.1	-16.7	-11.7	-15.5	-14.8
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.7	-25.6	-22.2	-17.2	-13.5	-12.8
150	**Predicted**	19.9	20.9	24.3	29.3	33	33.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.6	-16.6	-13.2	-8.2	-4.5	-11.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.1	-22.1	-18.7	-13.7	-10.0	-9.3
151	**Predicted**	15	16	19.4	24.4	28.1	28.8
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-22.5	-21.5	-18.1	-13.1	-9.4	-16.2
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-28.0	-27.0	-23.6	-18.6	-14.9	-14.2
152	**Predicted**	16.6	17.6	21	26	29.7	30.4
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.9	-19.9	-16.5	-11.5	-7.8	-14.6
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.4	-25.4	-22.0	-17.0	-13.3	-12.6
153	**Predicted**	16.9	17.9	21.3	26.3	30	30.7
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.6	-19.6	-16.2	-11.2	-7.5	-14.3
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-26.1	-25.1	-21.7	-16.7	-13.0	-12.3
154	**Predicted**	17.1	18.1	21.6	26.5	30.2	30.9
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-20.4	-19.4	-15.9	-11.0	-7.3	-14.1

Receptor Ref.	Description	dB $L_{A90,10min}$ at various Standardised 10 metre height (v_{10}) Wind Speeds (m/s)					
		2m/s	3m/s	4m/s	5m/s	6m/s	7m/s and above
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-25.9	-24.9	-21.4	-16.5	-12.8	-12.1
155	**Predicted**	18.7	19.8	23.2	28.2	31.9	32.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-18.8	-17.7	-14.3	-9.3	-5.6	-12.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-24.3	-23.2	-19.8	-14.8	-11.1	-10.4
156	**Predicted**	19.3	20.3	23.8	28.7	32.4	33.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-18.2	-17.2	-13.7	-8.8	-5.1	-11.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-23.7	-22.7	-19.2	-14.3	-10.6	-9.9
157	**Predicted**	15.8	16.8	20.3	25.2	28.9	29.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.7	-20.7	-17.2	-12.3	-8.6	-15.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.2	-26.2	-22.7	-17.8	-14.1	-13.4
157A	**Predicted**	15.7	16.7	20.1	25.1	28.8	29.5
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-21.8	-20.8	-17.4	-12.4	-8.7	-15.5
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-27.3	-26.3	-22.9	-17.9	-14.2	-13.5
158	**Predicted**	14.7	15.8	19.2	24.1	27.9	28.6
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-22.8	-21.7	-18.3	-13.4	-9.6	-16.4
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-28.3	-27.2	-23.8	-18.9	-15.1	-14.4
159	**Predicted**	20.3	21.3	24.7	29.7	33.4	34.1
	Daytime Criterion	37.5	37.5	37.5	37.5	37.5	45.0
	Daytime Excess	-17.2	-16.2	-12.8	-7.8	-4.1	-10.9
	Night-time Criterion	43.0	43.0	43.0	43.0	43.0	43.0
	Night-time Excess	-22.7	-21.7	-18.3	-13.3	-9.6	-8.9

EIAR VOLUME III
Appendices

CHAPTER 14 – LANDSCAPE AND VISUAL

Appendix 14.1: Methodology

APPENDIX 14.1: METHODOLOGY

Introduction

1. "*Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity*." (GLVIA3, paragraph 1.1). Wherever possible, identified effects are quantified, but the nature of landscape and visual assessment requires interpretation using professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and assessment of significance of the residual landscape and visual effects have been based on pre-defined criteria.

2. The Guidelines for Landscape and Visual Assessment (Third Edition) (GLVIA3) states that "*professional judgement is a very important part of the LVIA*" (paragraph 2.23) and that "*in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others*." (Paragraph 2.24). It goes on at paragraph 3.32 to state that *"there are no hard and fast rules about what effects should be deemed 'significant" but LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects."*

3. Landscape and Visual Assessments are separate, though linked processes which GLVIA3 notes are "*related but very different considerations*". The assessment of the potential effect on the landscape is carried out as an effect on the environmental resource (i.e., the landscape). Visual effects are assessed as an inter-related effect on people.

4. Landscape effects derive from changes in the physical landscape elements which may give rise to changes in its distinctive character and how this is experienced, including consideration of aesthetic and perceptual aspects.

5. Visual effects relate to changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes and to the overall effects with respect to visual amenity.

Establishing the Baseline

6. The **baseline** for consideration of landscape and visual effects is evaluated through desk study and site work and is the current situation at the time of the assessment, unless noted otherwise. Operational developments and those under construction are considered as part of the baseline and included as part of the assessment of landscape and visual effects.

7. The **future baseline** is considered to be changes to the landscape which are considered certain or likely to happen – including consented proposals which are not yet present in the landscape but are expected to be constructed. These may or may not be included as part of the landscape and visual baseline depending on individual project circumstances and the approach and reasoning is set out within the assessment.

8. For mineral workings the precise baseline for each assessment is stated and ideally agreed with the Local Planning Authority.

Landscape Effects

9. The starting point for any assessment is a desk-based assessment of published landscape studies, which may include landscape character assessments, sensitivity and capacity studies and/or landscape designation reviews. These documents are listed in the assessment references and relevant extracts may be included as appendices where this is judged appropriate.

10. The landscape effects of the proposed development are considered against the key characteristics of the receiving landscape. The degree to which the proposed development changes "*distinct and recognisable pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse*" ('An Approach to Landscape Character Assessment', Natural England, 2014), enables a judgement to be made as to the significance of the effect in landscape character terms.

11. Direct and indirect landscape effects are defined in GLVIA3. Direct effects may be defined as resulting *"directly from the development itself"* (paragraph 3.22). An indirect (or secondary) effect is one that results *"from consequential change resulting from the development"* (paragraph 3.22) and is often produced away from the site of the proposed development or as a result of a complex pathway or secondary association. The direct or physical landscape effects of the proposed development would generally be limited to within the planning application boundary. The indirect landscape effects are concerned with the visual effects and relate to effects associated with the introduction of the development seen in the context of the existing landscape and visual character of the view.

12. In order to reach an understanding of the effects of development upon the landscape resource it is necessary to consider different aspects of the landscape baseline including:

    - **Landscape Fabric/Elements**: The individual features of the landscape, such as hills, valleys, woods, hedges, tree cover, vegetation, buildings and roads for example which can usually be described and quantified.
    - **Landscape key characteristics**: The particularly notable elements or combinations of elements which make a particular contribution to defining or describing the character of an area, which may include experiential characteristics such as wildness and tranquility.

13. The **sensitivity** (high, medium, low) of the landscape to a particular development is considered on a case by case basis and considers the susceptibility of the landscape, which varies depending on the type of development proposed and the particular site location, and the landscape value (identified as national, regional, or community). As stated in GLVIA3, '*LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning but is not the same*'.

14. **Landscape value**: The importance attached to a landscape, often used as a basis for designation or recognition which expresses national or local authority consensus, because of its special qualities/attributes. The factors which are considered in landscape include aesthetic or perceptual aspects such as scenic beauty, tranquility or wildness or cultural associations as well as recreational/community value, conservation interests, landscape character and condition and representativeness/rarity.

15. **Landscape susceptibility** according to GLVIA3 means "*the ability of the landscape to accommodate the proposed development without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies*". Judgements on landscape susceptibility (high, medium, low) include references to both the physical and aesthetic characteristics and the potential scope for mitigation.

16. Susceptibility of landscape character areas are influenced by their characteristics and are often considered (though often recorded as 'sensitivity' rather than susceptibility) within landscape character assessments and capacity studies.

17. Susceptibility of designated landscapes is influenced by the nature of the special qualities and purposes of designation and/or the valued elements, qualities, or characteristics, indicating the degree to which these may be unduly affected by the development proposed.

18. The criteria and the detailed judgements regarding susceptibility and value of landscape receptors are identified within the sensitivity tables included within Appendix 14.4 to this assessment.

19. Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor as illustrated by the table below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

		Susceptibility		
		High	Medium	Low
Value	National	High	High/Medium	Medium
	Regional	High/Medium	Medium	Medium/Low
	Community	Medium	Medium/Low	Low

20. The **magnitude of landscape change** arising from the proposed development at any particular location is assessed in terms of its size or scale, geographic extent of the area or receptor that is influenced and its duration and reversibility.

21. The **scale** of the change takes account of:

    - degree of loss or alteration to key landscape features/elements; characteristics; and for designated areas – special qualities and/or purposes of designation;
    - distance from the development;
    - landscape context to the development;

22. The approach to assessing effects on landscape character is to consider the key characteristics for the Landscape Character Type (LCT) within which the proposed development is located (host) and the adjacent LCT's (non-host) and identify which of these the proposed development would affect. For the host LCTs, a large-scale change in landscape character is likely to occur where key characteristics would be lost or substantially changed. Where particular views are a key characteristic of a landscape type, large or medium scale landscape character effects may occur where the proposed development becomes a key feature of those views. A similar approach applies to designated landscapes, for which the effects on the defined purposes of designation and special qualities are considered.

23. Having established the size/scale of change (large, medium, small, negligible) to the landscape baseline, the geographic **extent** of the change can be identified (wide, intermediate, localised or limited) and a judgement made as to the degree of change for each landscape receptor.

24. **Duration** and reversibility can be linked depending on the nature of the development. Reversibility is a judgement about the ability and practicality of the proposed development to be reversible (such as wind farms which are predominantly reversible), partially reversible to something similar (such as

mineral extraction[1]) or a permanent change in the landscape (such as housing). Duration reflects how long the change will last. The duration of the change would be considered temporary when lasting less than one year; short term when lasting between one and 7 years; medium term when lasting between 7 and 15 years; or long term when lasting between 15 and 60 years, and permanent for more than 60 years[2].

25. Magnitude is considered taking into account the three contributory factors as illustrated by the diagrams included below.

Visual Effects

26. In order to identify the significance of a visual effect it is necessary to establish the relative sensitivity of the viewers and the magnitude of the change they experience. In this case sensitivity is a combination of both susceptibility of the viewer to the proposed change and the value of the views.

27. Those living within view of the scheme are usually regarded as the highest susceptibility group as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective. The susceptibility of potential visual receptors will also vary depending on the activity of the receptor. For visual receptors susceptibility and value are closely linked - the most valued views are also likely to be those where viewer's expectations will be highest.

28. The **value** of public views, which is the focus of GLVIA3, is identified as national, regional or community and will vary depending on the nature, location and context of the view and the recognised importance of the view. Considerations include cultural associations; designation or policy protection; views of or from landmarks; and/or the scenic quality of the view. The value attributed relates to the value of the view, e.g., a National Trail is nationally valued for access, but not always for the available views from every section.

29. Visual receptor **susceptibility** is defined as in accordance with the criteria below.

- **High** - Users of outdoor recreation focussed on the appreciation of views including footpaths, beauty spots and picnic areas; people experiencing views to or from important features of physical, visual, cultural or historic interest.
- **Medium** – Residents in dispersed rural communities, local road users and travellers on trains. People engaged in outdoor recreation with some appreciation of the landscape e.g., road cycling, nature conservation, golf and water-based recreation.
- **Low** - Workers, users of facilities and commercial buildings (indoors) experiencing views from buildings. Road and rail users on fast moving commuting or trunk routes. Visual receptors where views are incidental to the activity and/or location.

30. Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor as illustrated by the table below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

	Susceptibility		
	High	Medium	Low

[1] GLVIA3 page 91, paragraph 5.52

[2] Environmental Protection Agency Ireland, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022, Table 3.4, page 51

Value	National	High	High/Medium	Medium
	Regional	High/Medium	High/Medium	Medium/Low
	Community	High/Medium	Medium	Low

31. The **magnitude of visual change** arising from the proposed development at any particular location is assessed in terms of its size or scale (large, medium, small, negligible), geographic extent of the area or receptor that is influenced (wide, localised, limited) and its duration (short, medium, long, permanent).

32. The representative viewpoints are used as 'samples' on which to base judgements of the scale of effects on visual receptors. The wider extent of the effect and its duration are not captured in the viewpoint analysis (as a viewpoint cannot capture these factors for an entire route or area). As duration and extent are necessary considerations in determining magnitude of change; magnitude and significance judgements are provided for visual receptors and not for all representative viewpoints. The exceptions to this are specific viewpoints – where people visiting that location to look at the view are assessed as a visual receptor group.

33. With the exception of specific viewpoints, each route and receptor group will encompass a range of possible views, which might vary from no view of the development to very clear, close views. Therefore, effects are described in such a way as to identify where views towards the development are likely to arise and what the scale and duration and **extent** (wide, intermediate, Localised, Limited) of those views are likely to be. In some cases, this will be further informed by a nearby viewpoint and in others it will be informed with reference to ZTV studies, aerial photography and site visits. Each of these individual effects are then considered together in order to reach a judgement of the effects on the visual receptors along that route, or in that place.

34. The **scale of effect** arising from the proposed development at any particular viewpoint reflects the degree to which the nature of the views from that location would be changed and is taking into account:

    - The distance of the viewpoint from the development;
    - the degree to which the development is visible or screened;
    - the angle of view in relation to main receptor activity or main focus of the view;
    - the horizontal and vertical field of view occupied by the development; and
    - the extent and nature of other built development visible.

35. The approach to assessing effects on views is to consider the full 360-degree view from any given receptor – not just those towards the development and/or shown in visualisations. It is assumed that the change would be seen in clear visibility and the assessment is carried out on that basis. Where there are operational (and consented) developments considered as part of the baseline, the visual effects consider the effects of adding the proposed development to that baseline. Where appropriate, comment may be made on lighting and weather conditions.

36. **Duration** reflects how long the change will last and are rated in the same way as described above for landscape effects. The effects as a result of the proposed development would be considered temporary when lasting less than one year; short term when lasting between 1 and 7 years; medium term when lasting between 7 and 15 years; or long term when lasting between 15 and 60 years, and permanent for more than 60 years[3]. For visual receptors moving through the landscape (e.g., road

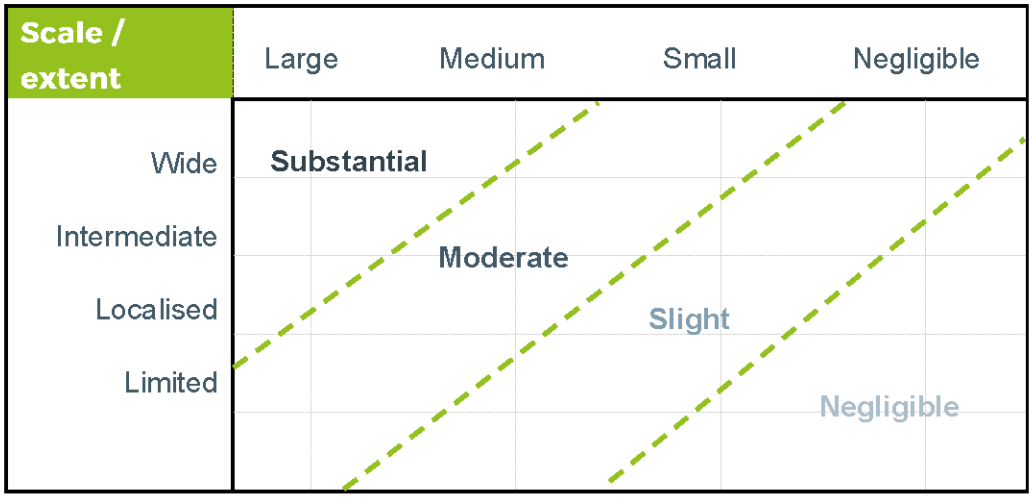
[3] Environmental Protection Agency Ireland, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Table 3.4, page 51

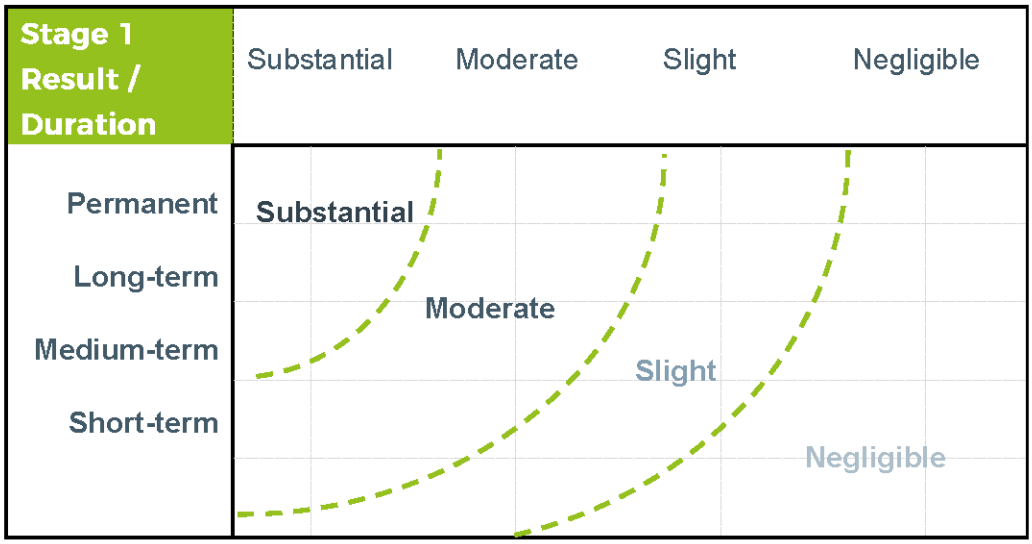
and rail users), the length of their journey during which they would see the development is reflected in the judgement of the geographic extent of effects.

37. Magnitude is considered taking into account the three contributory factors as illustrated by the diagrams included below.

Magnitude of Landscape and Visual Change

38. Scale of effect is the first factor in determining magnitude; which may be higher if the effect is particularly widespread and/or long lasting, or lower if it is constrained in geographic extent and/or timescale. The tables below illustrate how this judgement is considered as a two-step process. Firstly, scale and extent are considered, for which the outcomes are illustrated by the first part of the table; the second part of the table illustrates the influence of duration on this initial judgement. Where magnitude is judged to lie between levels, an intermediate assessment will be adopted.





Significance of Landscape and Visual Effects

39. The significance of any identified landscape or visual effect is assessed as major, moderate, minor or negligible. These categories are based on the consideration of sensitivity with the predicted magnitude of change. The table below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.

		Magnitude of Change			
		Substantial	Moderate	Slight	Negligible
Receptor Sensitivity	High	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/ Negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

40. Where the effect has been classified as Major or Major/Moderate this is considered to be equivalent to likely significant effects referred to in the EIA Regulations. Where 'Moderate' effects are predicted, professional judgement will be applied to ensure that the potential for significant effects arising has been thoroughly considered.

Beneficial/Adverse

41. Landscape and visual effects can be beneficial or adverse and, in some instances, may be considered neutral. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both. Whether an effect is beneficial, neutral or adverse is identified based on professional judgement. GLVIA 3rd edition indicates at paragraph 2.15 that this is a "*particularly challenging*" aspect of assessment, especially in the context of a changing landscape.

Cumulative Effects

42. In a broad generic sense, cumulative impacts "*result from the incremental changes caused by other past, present or reasonably foreseeable actions together with the project*"[4] However, an assessment of cumulative effects should focus on whether there are any potential cumulative impacts which are reasonably foreseeable and which are likely to influence the decision making of the proposed development, rather than an assessment of every potential cumulative effect[5], which in practice means focusing on other nearby development proposals and the effects that might arise from the combined influence of those developments on landscape and visual receptors.

43. As recommended by the NatureScot cumulative guidance, this assessment focusses on the "*additional cumulative change which would be brought about by the proposed development.*"[6]

44. As noted above, operational developments are included in the baseline, Consented development which are expected to be constructed, form part of the future baseline and will be included as such.

[4] GLVIA3 page 120, paragraph 7.1 quoting Hyder, 1999 '*Guidelines for the assessment of indirect and cumulative impacts as well as impact interactions*'

[5] GLVIA3 page 121 paragraph 7.5.

[6] Assessing the Cumulative Impact of Onshore Wind Energy Developments, NatureScot, 2021

However, where there is some uncertainty regarding the future construction of consented developments, they may be considered as the first scenario of the cumulative assessment.

45. Proposals in planning are considered where there is good reason to assume that the timing of decisions may be similar and significant cumulative effects are likely. The assessment of effects is considered within the cumulative assessment.

46. Proposals in scoping are noted but not considered within the cumulative assessment, as there is no certainty that these proposals will progress to planning submissions and the nature of the proposed schemes may be subject to change.

47. The assessment is based on the same landscape and visual baseline and receptor groups as the main LVIA, and the methodology is also the same in terms of forming and expressing judgements.

48. Cumulative effects on landscape receptors arise from combined direct and/or indirect effects on the same receptor – such as two developments within the same character area; or one development within, and one visible from, a designated area.

49. Cumulative effects on visual receptors arise either from two (or more) developments both being visible from the same place; or from sequential views as people travel.

50. In order to simplify what may otherwise be a complex assessment, the following approaches are also used:

    - The cumulative assessment considers scenarios within which developments may be 'grouped' - for instance two nearby cumulative proposals may be considered in one scenario if it is considered that the cumulative effects arising if one or both are developed are likely to be similar.
    - Receptors judged to receive Negligible or Slight-Negligible magnitude effects are not considered for cumulative effects on the basis that any significant effects arising would primarily be caused by the cumulative developments and would be unlikely to be contributed to by the proposed development.
    - Only those receptors judged likely to experience effects from the cumulative development(s) being considered within a given scenario are described within that scenario.

51. Qualitative assessment of design and aesthetic considerations arising as a result of cumulative development, and/or considerations set out within local guidance provided in relation to cumulative development, is also provided where relevant.

ANNEX 1: GLOSSARY OF TERMS

Term	Definition
CLVIA	Cumulative Landscape and Visual Impact Assessment.
Cumulative Effects	Cumulative effects are the additional effects arising from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Direct Effect	A direct (or primary) effect may be defined as an effect that is directly attributable to the development. [7]
GLVIA3	*'Guidelines for Landscape and Visual Impact Assessment, Third Edition'*, published jointly by the Landscape Institute and Institute of Environmental Management and Assessment 2013.
Indirect Effect	An indirect (or secondary) effect is an effect that results indirectly from the proposed project as a consequence of the direct effect, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects. [8]
Key Characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LVIA	Landscape and Visual Impact Assessment.
Landscape Capacity	The amount of change which a particular landscape character type or area is able to accommodate without significant detrimental effects on its character. Capacity is likely to vary according to the type and nature of change proposed.
Landscape Character	The distinct and recognisable pattern of elements in the landscape that makes one landscape different from another, rather than better or worse. [9]
Landscape Character Areas	These are single unique areas which are the discrete geographical areas of a particular landscape type. [10]
Landscape Character Types	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur, they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.
Landscape Effects	Effects on the landscape as a resource in its own right. [11]
Landscape Elements	Individual components which make up the landscape such as trees and hedges.

[7] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p155

[8] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p156

[9] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p156

[10] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157

[11] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157

Term	Definition
Landscape Features	Particularly prominent or eye-catching elements, like tree clumps, church towers or wooded skylines.
Landscape Quality or Condition	This is a measure of the physical state of the landscape. It may include the extent to which a typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements. [12]
Landscape Receptor	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Landscape Resource	The combination of elements that contribute to landscape context, character and value.
Landscape Value	The relative value or importance attached to different landscapes by society on account of their landscape qualities. [13]
Level of Effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the development.
Magnitude (of effect)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Mitigation	Measures including any process, activity or design to avoid, reduce, remedy or compensate for adverse environmental impact or effects of a development.
Photomontage	A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs.
Residential Visual Amenity	A collective term describing the views and visual amenity from a residential property, relating to the type, nature, extent and quality of views that may be experienced from the property and its 'domestic curtilage' including gardens and access driveway. Residential Visual Amenity is only one component of the overall Residential Amenity, others being for example noise, shadow flicker and access amongst others.
Residual Effects	Potential environmental effects remaining after mitigation.
Sense of Place	The essential character and spirit of an area: *genius loci* literally means 'spirit of the place'.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor. [14]
Significant Effects	It is a requirement of the EIA Regulations to determine the likely significant effects of development on the environment which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and sensitivity of the receptor) that should be attached to the impact described. Whether an effect should be considered significant is not absolute and requires the application of professional judgement.

[12] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157

[13] The Landscape Institute; Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations

[14] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p157

Term	Definition
Type or Nature of Effect	Whether an effect is direct, indirect, temporary or permanent, positive (beneficial), neutral or negative (adverse) or cumulative.
Visual amenity	Value of a particular place in terms of what is seen by visual receptors taking account of all available views and the total visual experience.
Visual Effect	Effects on specific views and on the general visual amenity experienced by people. [15]
Visual Receptors	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visualisation	Computer simulation, photomontage or other technique to illustrate the appearance of a development. [16]
Wildness	A quality of appearing to be remote, inaccessible and rugged with little evidence of human influence.
Wireframe or Wireline	A computer-generated line drawing of the DTM (Digital Terrain Model) and the proposed development from a known location.
Zone of Theoretical Visibility (ZTV)	Area within which a proposed development may have an influence or an effect on visual amenity. [17]

[15] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p158

[16] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p158

[17] The Landscape Institute/Institute of Environmental Management and Assessment; *Guidelines for Landscape and Visual Impact Assessment*; Spon; 2013; p158

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Appendices

CHAPTER 14 – LANDSCAPE AND VISUAL

Appendix 14.2: Photomontages Methodology

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innovision

Methodology Document

Wind Farm Photomontages

PHOTOGRAPHY & SITE SURVEY

- Site photography is captured in the clearest possible weather conditions available within the project timeframe. Where possible, the photographer is positioned with their back to the sun in order to achieve the best lighting conditions for the proposed development.
- The cameras used include Canon EOS-5D Mark III and Canon EOS-5D Mark IV with full frame sensors, mounted on a professional tripod and panoramic tripod head.
- All photography is captured as a series of images to make up a full 360° panoramic image using a fixed Canon EF 50mm f/1.4 USM Lens.
- The camera is set up at average eye level height (1.65m above ground level) and perfectly levelled using the tripod head levelling device, a hot-shoe spirit bubble and the camera's built-in accelerometers. This enables a seamless stitch of the 50mm images which make up the full 360° panorama.
- The X, Y & Z position of the camera is captured at each viewpoint location using a mapping grade GNSS unit with correction technology to achieve an accuracy of sub 20cm.
- As well as the camera position, in some instances, elements such as road signs, lampposts & telegraph poles are also surveyed in order to help position the proposal at the photomontage stage where no landform is visible.

3D TERRAIN MODELLING, VISIBILITY MAPPING & PHOTOMONTAGE PRODUCTION

- Ordnance Survey 10m DTM Height data is used to build a digital terrain of the study area.
- All viewpoint locations are within this digital terrain.
- The effects of earth curvature and refraction due to light are built into this digital terrain.
- A Zone of Theoretical Visibility (ZTV) Map is calculated in order to identify places within the study area which have a theoretical view of the development. This calculation does not however, take into account screening due to trees, hedgerows, buildings etc. These elements can have a significant bearing on the real-life extent of visibility.
- A wireframe view of the proposal and surrounding terrain is generated from each viewpoint location using specialist 3D GIS software (43D Topos), incorporating the digital terrain data and the proposed development layout.
- At this point, any surveyed placement objects are also rendered in the view to aid placement.
- This wireframe is then brought in to the panoramic images and aligned to achieve correct placement of the proposed development.
- Once correctly placed, a more detailed render is output from Autodesk 3D Studio Max or Trimble Sketchup, in order to achieve a photorealistic finish to the photomontages. This render takes into account the date and time of photography capture as well as the particular lighting conditions recorded on the day.

3D TERRAIN MODELLING, VISIBILITY MAPPING & PHOTOMONTAGE PRODUCTION

- For all required viewpoints a single, 90° baseline panorama accompanied by a wireframe view is produced.
- The wireline view includes the proposed wind farm along with any other operational and consented wind farms.
- On the next page a 53.5° wireframe view of the proposed wind farm can be included.
- Following this, a 53.5° planar projection photomontage is output.
- In certain circumstances due to proximity to the proposed development, it may be necessary to have a series of 53.5° planar photomontages in order to include the whole development.
- In addition to the images, each page contains viewpoint location information, camera details and photography capture & weather information.

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Appendices

CHAPTER 14 – LANDSCAPE AND VISUAL

Appendix 14.3: Viewpoint Analysis

APPENDIX 14.3: VIEWPOINT ANALYSIS

Introduction

1. A viewpoint assessment has been carried out from a selection of key representative viewpoint locations to inform the assessment of the likely magnitude and significance of landscape and visual effects arising as a result of the Proposed Development.

2. Following desk-top analysis and site survey work, a total of 21 viewpoint locations were selected to represent the main landscape and visual receptors found in the study area.

3. The locations of the selected viewpoints are shown in EIAR **Volume IV**. Details for each viewpoint are provided below. Panoramic photographs, wireline diagrams and photomontages (in most cases) are provided to illustrate the existing view at each viewpoint location and the likely extent of the Proposed Development within the view (see Viewpoints 1-21). A summary of the viewpoint analysis is provided in **Table 14.8** in EIAR **Volume II, Chapter 14 Landscape and Visual**.

4. This viewpoint assessment considers the nature of the predicted view and the scale of change. The wider extent of the effect (beyond the individual viewpoint considered), and its duration, are not captured in the viewpoint analysis (as a single viewpoint cannot capture extent or duration) and are considered in the main body of the assessment (see Chapter 14). Extent and duration are factors in the overall judgement on magnitude of change, therefore judgements on magnitude of change and overall level of effect and significance are also provided in the main assessment.

5. The method of assessment used for the viewpoint analysis, which is described in EIAR **Volume III, Appendix 14.1**, accords with current best-practice guidance for Landscape and Visual Impact Assessment (Landscape Institute and Institute of Environmental Management, 2013). Observations are made of the baseline landscape and visual characteristics at each of the representative viewpoints. Observations, computer modelling and professional judgement are applied to determine the scale of change attributable to the Proposed Development **(Large, Medium, Small and Negligible**) upon landscape character and visual amenity at each individual viewpoint in order to determine the scale of effect.

6. The visual assessment considers the screening effect of intervening landform, vegetation and built form and the potential for changes to those baseline features. It assumes excellent clear weather conditions; although the influence of different seasons, weather, sunlight and visibility conditions have been considered, where relevant. Viewpoint photography was taken during summer and winter.

Viewpoint 1: Lisgriffin

Location and distance from closest turbine	View from the southern fringe of Lisgriffin on the L1200. 1.88km (T2)
Grid Ref (ITM)	549301, 607843
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium
Existing View / Do Nothing Scenario	The viewpoint is slightly elevated above the undulating agricultural plain and comprises of broad slopes that fall away from the viewpoint towards mature hedges and woodland. Pasture is the main landcover with field boundaries of hedges, belts of woodland and mesh fences in the foreground. The elevated location affords views 'into' the landscape and to distant hills that form a dark backdrop to the green fields and woodland. The overall view composition is relatively simple with a horizontal emphasis.
Predicted view	The proposed turbines would be very noticeable features in the view. The towers and nacelles of nine turbines would be visible with the lower parts of towers screened by intervening vegetation. The array would occupy approximately 53° in a balanced linear array that fits the large scale landscape. Whilst the met mast would be discernible, it would be a minor element of the view relative to the turbines. The substation would not be visible.
Scale of landscape change	The landscape is vast in scale with a relatively simple composition of open pasture fields with mature hedges and trees with belts and blocks of woodland. The turbines would be new large scale elements introducing movement into the landscape. The array would be seen as a strong linear feature with a balanced composition that fits the large scale landscape with a horizontal emphasis. Here the scale of landscape change would be Medium.
Scale of visual change	The linear array is well balanced and while it occupies a large proportion of the view, the spacing of turbines and horizontal emphasis fits the simple view composition. The spacing and height of turbines is regular and consistent across the array which gives a cohesive appearance. The nearest turbines appear fairly large although not disproportionate to the overall composition of the view. The scale of change in this particular view would be Medium (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 2: Mallow Road, Boherascrub

Location and distance from closest turbine	View from crossroads on the L1200 at Boherascrub. 1.16km (T6)
Grid Ref (ITM)	549879, 606771
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The view comprises of gradually rising ground with landcover of pasture fields enclosed by post and wire fences with mature hedges with trees forming the horizon in views towards the Site. There are more open areas where hedges are gappy or absent. There is a telegraph line on timber poles in the right of the view and an electricity transmission line on timber poles passes across the view in the middle ground. The view is relatively open from this elevated location with longer distance expansive views to the north. The composition of the view shown here is relatively simple.
Predicted view	The proposed turbines would be very noticeable features in the view. The towers and nacelles of nine turbines would be visible with the lower parts of towers screened by intervening vegetation and landform. The array would occupy approximately 70° in a balanced linear array that fits the large scale landscape. The met mast would be barely discernible, largely screened by intervening vegetation and landform. The substation would not be visible.
Scale of landscape change	The landscape is large in scale with a relatively simple composition of open pasture fields with mature hedges and trees along some boundaries but more prevalent in the wider landscape. The turbines would be new large scale elements introducing movement into the landscape. The array would be seen as a strong linear feature with a balanced composition that fits the large scale landscape with a horizontal emphasis. Here the scale of landscape change would be Medium.
Scale of visual change	The linear array is well balanced and while it occupies a large proportion of the view, the spacing of turbines and horizontal emphasis fits the simple view composition. The nearest turbines appear fairly large although not disproportionate to the overall composition of the view. The scale of change in this particular view would be Medium (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 3: East of Kilmaclenine crossroads

Location and distance from closest turbine	View from local road to the east of Kilmaclenine crossroads. 2.1km (T9)
Grid Ref (ITM)	551743, 605535
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The view comprises of trimmed hedges alongside a minor road that passes through and area of dispersed, low density residential properties and farmsteads. In the middle ground there are gappy hedges and mature trees in hedge boundaries on the skyline. The land rises in the direction of the Site which shortens views in that direction. There are longer distance views to the north and south across undulating farmland to distant hills.
Predicted view	The proposed turbines would be very noticeable features in the view. The nacelles and towers of seven turbines would be visible and partly screened by intervening hedgerows and landform. Two turbines (T1 and T2) would be screened by a tree in the foreground. Visible turbines in the array would occupy approximately 16° in a balanced composition. Whilst the met mast would be discernible, it would be a minor element of the view relative to the turbines. The substation would not be visible.
Scale of landscape change	The landscape is medium to large in scale with an elevated position above the surrounding valleys. The turbines would be seen as a compact irregular array with a limited influence on landscape character. Here the scale of landscape change would be Small.
Scale of visual change	The array is a compact although irregular composition with the lower parts of turbines screened mainly by landform with intervening vegetation also providing some screening. While the array is slightly irregular there is cohesion in the way the turbines are presented in the view and they occupy a small proportion of the open views from this location. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 4: L5523 West of Groine

Location and distance from closest turbine	View from local road to the west of Groine. 1.02km (T8)
Grid Ref (ITM)	549234, 604147
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The view comprises of gradually rising ground with landcover of arable land enclosed by mature hedges with trees. There is a timber electricity transmission pole in the left of the view. The view is short as it is curtailed by the rising ground in the foreground. The composition of the view is simple.
Predicted view	The proposed turbines would be very noticeable features in the view. The nacelles of five turbines would be visible with the towers of three turbines being visible. Four turbines would be screened by intervening vegetation in the foreground of the view. Visible turbines in the array would occupy approximately 38° in a balanced composition. The met mast would not be visible be screened by intervening vegetation and landform. The substation would not be visible.
Scale of landscape change	The wider landscape is vast in scale when viewed from more elevated locations and in the plain where Viewpoint 4 is located there is a sense of enclosure and curtailment of views by hedges and woodland giving a smaller scale landscape. The turbines would be new large scale elements introducing movement into the landscape. Here the scale of landscape change would be Medium/small.
Scale of visual change	The array is a reasonably balanced composition with the more distant turbines screened by intervening hedges and trees. Given the short distance to the nearest turbine and the degree to which five of the turbines would be visible, the scale of change in this particular view would be Medium (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 5: East of Kilgilky crossroads

Location and distance from closest turbine	View from local road to the east of Kilgilky crossroads. 1.8km (T7)
Grid Ref (ITM)	547399, 604341
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The view comprises of a scrubby hedge in the foreground beyond which the ground is rises slightly in the direction of the Site. Landcover is pasture and arable fields enclosed by mature hedges with trees. There is a timber telegraph pole in the right of the view that carries a line running parallel with the minor road on which the viewpoint is located. An electricity transmission line passes through the field in the middle ground. The view is short as it is curtailed by the rising ground and vegetation. The composition of the view is simple.
Predicted view	The proposed turbines would be very noticeable features in the view. The nacelles and towers of nine turbines would be visible and partly screened by foreground roadside vegetation and by intervening hedgerows in the middle ground. Visible turbines in the array would occupy approximately 38° in a balanced composition. Whilst the met mast would be discernible, partially screened by intervening vegetation and landform, it would be a minor element of the view relative to the turbines. The substation would not be visible.
Scale of landscape change	The landscape is medium in scale when viewed from more elevated locations and in the farmland plain where Viewpoint 5 is located there is a sense of enclosure and curtailment of views by hedges and woodland giving a smaller scale landscape. The turbines would be new large scale elements introducing movement into the landscape. Here the scale of landscape change would be Medium/small.
Scale of visual change	The array is a reasonably balanced composition with the lower parts of turbines screened by intervening vegetation. Given the short distance to the nearest turbine and the degree to which five of the turbines would be visible, the scale of change in this particular view would be Medium (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 6: Kilgillky area

Location and distance from closest turbine	View from the L1204 in the Kilgilliky area. 2.58km (T1)
Grid Ref (ITM)	545903, 604789
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The viewpoint is situated on the L1204 where it passes through an area of scattered residential properties. The view looks across gradually rising ground with landcover of pasture fields bounded by trimmed hedges. There are also areas of outgrown and mature hedges with trees with woodland on the horizon. The overall view composition is relatively simple with a horizontal emphasis.
Predicted view	The proposed turbines would be noticeable features in the view. The towers and nacelles of nine turbines would be visible with the lower parts of towers screened by intervening vegetation and landform. The array would occupy approximately 32° in a balanced linear array that fits the large scale landscape. The met mast partially screened by intervening vegetation and landform, would be barely discernible, and would be a very minor element of the view relative to the turbines. The substation would not be visible.
Scale of landscape change	The landscape is medium-large in scale with a relatively simple composition of open pasture fields with trimmed hedges with some mature hedges and woodland on the horizon. The turbines would be new large scale elements introducing movement into the landscape. The array would be seen as a strong linear feature with a reasonably balanced composition that fits this medium to large scale landscape. Here the scale of landscape change would be Medium/small.
Scale of visual change	The linear array is reasonably balanced occupying a moderate proportion of the view. While there is some minor overlapping of turbines in the right of the array the overall spacing and height of turbines is regular and consistent across the array which gives a cohesive appearance. The scale of change in this particular view would be Medium (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 7: R580 West of Curraglass

Location and distance from closest turbine	View from regional road to the west of Curraglass. 1.78km (T1)
Grid Ref (ITM)	546269, 606830
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The view comprises of gradually undulating ground with landcover of pasture fields enclosed by mature hedges with trees. There are more open areas where hedges are gappy or absent. There is a telegraph line on timber poles passing across the view in the middle ground The view is relatively open with low level screening by hedges and woodland. The composition of the view is relatively simple with a horizontal emphasis.
Predicted view	The proposed turbines would be noticeable features in the view. The towers and nacelles of nine turbines would be visible with towers partly screened by intervening vegetation. The array would occupy approximately 16° in a compact composition occupying a discrete area. Whilst the met mast would be discernible, partially screened by intervening vegetation and landform, it would be a minor element of the view relative to the turbines. The substation would not be visible.
Scale of landscape change	The landscape is medium-large in scale with a relatively simple composition of open pasture fields with mature hedges and open areas where hedges are absent or gappy. The turbines would be new large scale elements introducing movement into the landscape in a discrete area. Here the scale of landscape change would be Medium/small.
Scale of visual change	The array is compact and occupies a small proportion of views available from this location. The nearest turbines appear fairly large although not disproportionate to the overall composition of the view. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 8: R580 East of Curraglass

Location and distance from closest turbine	View from regional road to the east of Curraglass. 0.96km (T1)
Grid Ref (ITM)	547904, 6072777
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The view comprises of fairly level ground with landcover of pasture fields enclosed by mature hedges with trees. There is a telegraph line on timber poles passing across the view in the middle ground. The view is relatively open with low level screening by hedges and woodland. There are views of distant hills to the south that form the horizon visible through gaps in hedges or above woodland. The composition of the view is relatively simple with a horizontal emphasis.
Predicted view	The proposed turbines would be very noticeable features in the view. The towers and nacelles of nine turbines would be visible with the towers of four turbines being largely screened by intervening vegetation in this view. The array would occupy approximately 45° in a reasonably balanced composition. Whilst the met mast would be discernible, largely screened by intervening vegetation and landform, it would be a very minor element of the view relative to the turbines. The substation would not be visible.
Scale of landscape change	The landscape is large in scale with a relatively simple composition of open pasture fields with mature hedges and longer views where hedges are absent or lower. Distant hills provide a backdrop of gradual sloping land and a degree of containment. The turbines would be new large scale elements introducing movement into the landscape. Here the scale of landscape change would be Medium.
Scale of visual change	The array is a reasonably balanced composition. Given the short distance to the nearest turbine and the degree to which the turbines would be visible, the scale of change in this particular view would be Medium (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 9: Ballyclogh area

Location and distance from closest turbine	View from the L5310 in the Ballyclogh area. 4.47km (T7)
Grid Ref (ITM)	548850, 600703
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The viewpoint is situated on a local road to the south of Ballyclogh village. The view looks across fairly level ground with landcover of pasture fields which are bounded by post and wire fences and outgrown mature hedges. There is a telegraph line on timber poles in the right of the view and distant hills are visible on the horizon. The overall view composition is relatively simple with a horizontal emphasis.
Predicted view	The proposed turbines would be visible and partly screened by a mature hedge in the middle ground. The towers and nacelles of three turbines would be visible with the nacelle of one turbine and blades of two others discernible. The proposed development would occupy approximately 20° in a well balanced linear array that fits the medium-large scale working landscape. The met mast would be screened by the intervening vegetation. The substation would not be visible.
Scale of landscape change	The landscape is medium-large in scale with a relatively simple composition of pasture fields with post and wire fences and mature. These characteristics are expressed consistently in the area where the viewpoint is located. The turbines would be noticeable new elements introducing movement into the landscape. The array would be seen as a linear feature with a well-balanced composition that fits this medium to large scale working landscape. Here the scale of landscape change would be Small.
Scale of visual change	The linear array is well balanced occupying a small proportion of the view. The regular spacing of the turbines and height in the landscape mean that the composition is balanced and fits the horizontal emphasis of the landscape and does not overwhelm the existing view composition. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 10: R580 near Sally's Cross

Location and distance from closest turbine	View from the R580 near Sally's Cross. 8.42km (T1)
Grid Ref (ITM)	540070, 603501
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium
Existing View / Do Nothing Scenario	The viewpoint is situated on the R580 to the east of the junction at Sally' Cross and at the junction with L95801-1. The view comprises of the R580 road with hedges on either side beyond which are arable fields bounded by outgrown hedges and belts of trees. Telegraph lines on timber poles run on either side of the road. The overall view composition is relatively simple.
Predicted view	The proposed turbines would be mostly screened by intervening landform and vegetation. Blade movement behind the intervening trees would be barely discernible. The met mast would be screened by intervening vegetation and land form. The substation would not be visible.
Scale of landscape change	The scale of landscape change would be Negligible.
Scale of visual change	The scale of visual change would be Negligible.

Viewpoint 11: Kilbrin

Location and distance from closest turbine	View from the eastern part of Kilbrin. 4.39km (T1)
Grid Ref (ITM)	543645, 607049
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium
Existing View / Do Nothing Scenario	The viewpoint is situated in the eastern part of the village of Kilbrin where there is a gap in buildings near the village cemetery. The viewpoint location is elevated above the agricultural plain and looks out across the north wall of the cemetery beyond which there are mature trees. The ground slopes down from the viewpoint in the direction of the Site and the middle ground comprises of a mosaic of fields enclosed by hedges and woodland. The distant horizon is formed by rounded hills. The overall view composition is diverse with a mixture of settlement, working rural farmland and remote hills.
Predicted view	The proposed turbines would be noticeable in the middle ground. The towers and nacelles of nine turbines would be visible. lower parts of towers screened by intervening vegetation and landform. The proposed development would occupy approximately 10° in a compact array in the large scale working landscape. Whilst the met mast would be discernible, it would be a very minor element of the view relative to the turbines. The substation would not be discernible.
Scale of landscape change	The landscape is large in scale with a diverse composition of settlement, working farmland and distant hills. The turbines would be noticeable new elements introducing movement into the landscape. The array would be seen as a distinctive addition to the working farmland landscape that occupies most of the middle ground. Here the scale of landscape change would be Small.
Scale of visual change	The linear array is relatively compact well-balanced occupying a small proportion of the view. The large scale of the landscape and expansive views mean that the turbines would not overwhelm the view composition. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 12: R580 Buttevant

Location and distance from closest turbine	View from the R580 on the western fringes of Buttevant. 5.42km (T6)
Grid Ref (ITM)	553570, 609063
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The viewpoint is situated on the R580 on the western edge of Buttevant where the village fringe landscapes transition to the wider farmland of the large scale of the wider fertile plain. The view comprises of gently undulating pasture fields bounded by post and wire fences, managed hedges and outgrown hedges and trees. Distant hills are visible on the horizon with views in the direction of the site truncated by mature hedges. The overall view composition is diverse with a mixture of settlement, working rural farmland and remote hills.
Predicted view	The proposed turbines would be visible above hedges in the middle ground. The nacelles of five turbines would be visible and four turbines would be screened by hedges. The proposed development would occupy approximately 18° in a regularly spaced linear array with minimal overlapping of turbines. The met mast would be screened by intervening vegetation and landform, the substation would not be visible.
Scale of landscape change	The landscape visible in the view is medium-large in scale with a diverse composition of settlement, working farmland and distant hills. The turbines would be noticeable new elements introducing movement into the landscape. The array would be seen as a noticeable addition to the working farmland landscape. Here the scale of landscape change would be Negligible.
Scale of visual change	The linear array is well balanced occupying a small proportion of the view. The large scale of the wider landscape, the low level screening by hedges and longer distance views mean that the turbines would not overwhelm the view composition. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 13: Knockcloona area

Location and distance from closest turbine	View from the L5501 in the Knockcloona area. 6.8km (T1)
Grid Ref (ITM)	543399, 611338
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The viewpoint is situated on a minor road to the west of Liscaroll. The view comprises of pasture fields in the foreground bounded by mature hedges. The field slopes down to a broad valley or plain in which there is a mosaic of pasture fields bounded by mature hedges and large blocks of woodland. The plain stretches to the distant horizon which is formed by a range of low hills that extend across the view. The overall view composition is diverse with a mixture of settlement, working rural farmland and remote hills.
Predicted view	The proposed turbines would be visible as a compact array partly screened by intervening landform and woodland. The nacelles and upper parts of towers of nine turbines would be visible and the proposed development would occupy approximately 6°. The met mast partially screened by intervening vegetation and landform, would be barely discernible, and would be a very minor element of the view relative to the turbines. The substation would not be discernible.
Scale of landscape change	The landscape visible in the view is large in scale with a diverse composition of settlement, working farmland and distant hills. The turbines would be noticeable new elements introducing movement into the landscape. The array would be seen as a noticeable addition to the working farmland landscape and would fit its immediate context in this view. Here the scale of landscape change would be Small/negligible.
Scale of visual change	The compact array is party screened by landform and intervening woodland occupying a small proportion of an elevated, expansive view. The large scale of the wider landscape, the low level screening by landform and woodland and longer distance views mean that the turbines would not overwhelm the view composition. The turbines would also sit well into their immediate context. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 14: Churchtown

Location and distance from closest turbine	View from Egmont Road on the western fringes of Churchtown. 7.38km (T1)
Grid Ref (ITM)	549516, 613534
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium

Existing View / Do Nothing Scenario	The viewpoint is situated where there is a transition from the village of Churchtown to the more open farmland to the west. The road on which the viewpoints is located passes through an area of scattered houses, pasture fields and paddocks which are bounded by mature hedges and trees with some open field boundaries where hedges are lower. The view looks across level ground of pasture fields and paddocks. The horizon in the middle ground is formed by a low hill with mature tree cover and pasture fields. The overall view composition has an enclosed character.
Predicted view	Blade tips only of the proposed turbines would barely be discernible above woodland on the horizon. The met mast and substation would not be visible.
Scale of landscape change	Given that blade tips only would be visible the scale of landscape change would be Negligible.
Scale of visual change	Given that blade tips only would be visible the scale of visual change would be Negligible.

Viewpoint 15: Mount Hillary

Location and distance from closest turbine	View from forest track on Mount Hillary. 11.28km (T7)
Grid Ref (ITM)	542648, 595898
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Recreational – high/medium
Existing View / Do Nothing Scenario	The viewpoint is situated at an elevated location on Mount Hillary which is a forested hill at the southern edge of the Fertile Plain with Moorland Fringe landscape character area. The view is expansive and long distance encompassing a vast area of farmland mosaic with woodland, scattered settlements, dwellings and farm buildings. The horizon of distant hills provides containment to views and marks the transition to upland plateau landscapes. Operational Boolard and Rathnacally wind farms are visible as are turbines at Knocknatallig and Castlepook wind farms. The overall view composition is diverse and complex with a mixture of settlement, working rural farmland and remote hills.
Predicted view	The proposed development would be visible as an array of regularly spaced turbines at a similar height above ground. The turbines and met mast would be seen against a backdrop of farmland plain and hills receding into the distance. They would occupy approximately 10°. The met mast would be barely discernible, and would be a very minor element of the view relative to the turbines. The substation would not be discernible
Scale of landscape change	The landscape visible in the view is vast in scale with a diverse composition of settlement, working farmland and distant hills. The turbines would be noticeable new elements appearing closer than other wind turbines. While the array would be seen as a noticeable addition to the working farmland landscape it would fit its immediate context and be accommodated in the vast scale of the farmland plain. Here the scale of landscape change would be Small/negligible.

Scale of visual change	The array would occupy a small proportion of the view. While the movement of the rotors would be noticeable, the distance to the turbines and the expansive and diverse nature of the view means that the effects of movement on the composition of views would be limited. The vast scale of the landscape and expansive views also mean that the turbines would not overwhelm the view composition. The turbines would also sit well into their immediate context and the spacing of turbines in the layout mean it is visually permeable. The scale of change in this particular view would be Small.

Viewpoint 16: Glentaine/Dromahane area

Location and distance from closest turbine	View from near St John's Cemetery Glentaine. 10.2km (T8)
Grid Ref (ITM)	548576, 595005
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Residents – medium
Existing View / Do Nothing Scenario	The viewpoint is situated near St John's Cemetery in Glentaine where there is a gap in buildings and vegetation that allows relatively uninterrupted views in the direction of the Site. The viewpoint location is elevated above the agricultural plain and looks out across an unused walled area of the cemetery. Beyond the cemetery boundary there is a belt of mature trees that interrupt views toward the Site. There are views of the gently undulating farmland plain extending into the distance beyond which low hills form the horizon. Turbines of Knocknatallig and Castelpook wind farms are visible on the horizon against a backdrop of hills. The overall view composition is diverse with a mixture of settlement, working rural farmland and remote hills.
Predicted view	The proposed turbines would be visible in the middle ground partly screened by intervening vegetation at this viewpoint location. The towers and nacelles of five turbines would be visible from the viewpoint location and it is likely that all turbines could be seen from locations in the vicinity of this viewpoint through wider gaps in vegetation. It is more likely that intermittent views would be experienced from this locality therefore the viewpoint is representative of views. The proposed development would occupy approximately 9° in a regular linear array in the large scale working landscape. The met mast will be partially screened by intervening vegetation and landform, and would be a very minor element of views, relative to the turbines The substation would not be discernible.
Scale of landscape change	The landscape is large in scale with a diverse composition of settlement, working farmland and distant hills. The turbines would be noticeable new elements introducing movement into the landscape. The array would be seen as a distinctive addition to the working farmland landscape that occupies most of the middle ground. Here the scale of landscape change would be Small/negligible.
Scale of visual change	The linear array is well balanced occupying a small proportion of the view. The large scale of the landscape and expansive views mean that the turbines would not overwhelm the view composition particularly as intervening vegetation provides intermittent screening. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents

	and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 17: Lag

Location and distance from closest turbine	On a minor road to the south of Lag crossroads. 6.92km (T9)
Grid Ref (ITM)	556372, 607056
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Road user – medium/low Residents – medium
Existing View / Do Nothing Scenario	The viewpoint is situated on a minor road to the south of lag crossroads in a Cork County Council High Value Landscape Area. The view comprises of a gently sloping pasture fields in the foreground in which a lattice pylon is located. Long distance views are curtailed by mature trees and forestry in the middle ground. The overall view has a relatively simple composition of rural character with elements of infrastructure and single dwellings also visible.
Predicted view	The nacelles and upper parts of tower of nine turbines would be visible above intervening vegetation. The proposed development would occupy approximately 11° in a regular linear array in the medium scale working landscape. The met mast would not be discernible, screened by intervening vegetation and landform. The substation would not be discernible.
Scale of landscape change	The landscape visible at this location is medium in scale with a degree of enclosure by trees and forestry. The turbines would be noticeable new elements introducing movement into the landscape. The array would be seen beyond the immediate context of enclosed pasture fields, woodland and forestry separated from the locality by mature trees in the middle ground. Here the scale of landscape change would be Small.
Scale of visual change	The linear array is well balanced occupying a small proportion of the view. The turbines would be partly visible and separated from the immediate locality by intervening vegetation. While the turbines would be a noticeable addition, they would not overwhelm the view composition due to the enclosed nature of views. The scale of change in this particular view would be Small (note that commentary on effects upon the visual amenity of residents and communities in the round is considered in EIAR **Volume II, Chapter 14 Landscape and Visual**).

Viewpoint 18: Caroline Mountain

Location and distance from closest turbine	On a footpath on south facing slopes of Caroline Mountain. 12.03km (T2)
Grid Ref (ITM)	557773, 614391
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe

Visual Receptor & Sensitivity	Recreational – high/medium
Existing View / Do Nothing Scenario	The viewpoint is situated on a footpath on south facing slopes of Caroline Mountain. Caroline Mountain is a minor hill summit in the Ballyhoura Range of hills which is a destination for walking, mountain biking and horse riding. The viewpoint is located Cork County Council High Value Landscape Area. The view comprises of gradually sloping terrain in the foreground with landcover of rough grassland and gorse scrub. The land slopes down to the farmland plain and as mosaic of pasture fields, woodland, scattered farm buildings and dwellings. The farmland plain extends into the distance where a range of low hills form the horizon to views providing containment to the vast area of intervening plain. The overall view composition is diverse and complex with a mixture of settlement, working rural farmland and remote hills.
Predicted view	The proposed development would be visible as an array of regularly spaced turbines at a similar height above ground. The turbines would be seen against the backdrop of woodland, farmland plain and hills receding into the distance. The turbines would occupy approximately 9°. The met mast and substation would not be discernible.
Scale of landscape change	The landscape visible in the view is vast in scale with a diverse composition of settlement, working farmland and distant hills. The turbines would be noticeable new elements and while the array would be seen as a noticeable addition to the working farmland landscape it would fit its immediate context and be accommodated in the vast scale of the farmland plain. Here the scale of landscape change would be Small/negligible.
Scale of visual change	The array would occupy a small proportion of the view. While the movement of the rotors would be noticeable, the distance to the turbines and the expansive and diverse nature of the view means that the effects of movement on the composition of views would be limited. The vast scale of the landscape and expansive views also mean that the turbines would not overwhelm the view composition. The turbines would also sit well into their immediate context and the spacing of turbines in the layout mean it is visually permeable. The turbines would not appear higher than the distinctive hills in the distance. The scale of change in this particular view would be Small.

Viewpoint 19: Rahan Mountain

Location and distance from closest turbine	On a footpath on northwest facing slopes of Rahan Mountain. 14.27km (T9)
Grid Ref (ITM)	561933, 598035
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Recreational – high/medium

Existing View / Do Nothing Scenario	The viewpoint is situated on a footpath on northwest facing slopes of Rahan Mountain. Rahan Mountain is a small, rounded hill summit. It is an outlier to the Nagles Mountains range of hills to the southeast which is a destination for walking, mountain biking and horse riding. The viewpoint is located Cork County Council High Value Landscape Area. The view comprises of stubble fields in the foreground that gradually slope down to the farmland plain and a mosaic of pasture fields, woodland, settlement, scattered farm buildings and dwellings. A quarry is visible in the middle ground and the eastern edge of Mallow is also discernible. The farmland plain extends into the distance and appears vast in scale. The overall view composition is diverse and complex with a mixture of settlement, mineral extraction and working rural farmland.
Predicted view	The proposed development would be visible as a compact array seen against the backdrop of woodland and farmland plain receding into the distance. The turbines would occupy approximately 2.5°. The met mast and substation would not be discernible.
Scale of landscape change	The landscape visible in the view is vast in scale with a diverse composition of settlement, mineral extraction and working farmland. The turbines would be minor new elements and would fit its immediate context and be accommodated in the vast scale of the farmland plain. Here the scale of landscape change would be Negligible.
Scale of visual change	The array would occupy a very small proportion of the view. While the movement of the rotors would be noticeable, the distance to the turbines and the expansive and diverse nature of the view means that the effects of movement on the composition of views would be very limited. The turbines would sit well into their immediate context and the compact layout means the proposed development would occupy a discrete well-defined area. The scale of change in this particular view would be Negligible.

Viewpoint 20: Rathcool area

Location and distance from closest turbine	At the start of a footpath on a hill to the east of Rathcool. 17.9km (T7)
Grid Ref (ITM)	534807, 594138
Landscape Character Area & Sensitivity	Broad Marginal Middleground Valleys
Visual Receptor & Sensitivity	Recreational – high/medium
Existing View / Do Nothing Scenario	The viewpoint is situated at the start of a footpath that provides access to a small, wooded hill to the east of Rathcool. The view looks across pasture slopes in the foreground with wooded and forested slopes of adjacent hills in the middle ground. The shallow valley below extends towards the farmland plain which stretches into the distance. The overall view composition is diverse with a mixture of landcover and varying topography with well-defined valleys and hills.
Predicted view	The proposed development barely be discernible as it would be largely screened by intervening landform and vegetation. The turbines would occupy approximately 5° although blade tips only would be discernible.
Scale of landscape change	The landscape visible in the view is vast in scale with a diverse composition of settlement, mineral extraction and working farmland.

	The turbines would be a barely discernible addition to the landscape. Here the scale of landscape change would be Negligible.
Scale of visual change	The array would barely be discernible. The scale of change in this particular view would be Negligible.

Viewpoint 21: N72 (S14) Scenic Route

Location and distance from closest turbine	From the grass verge alongside the N72 (S14) Scenic Route. 7.1km (T9)
Grid Ref (ITM)	550759, 598198
Landscape Character Area & Sensitivity	Fertile Plain with Moorland Fringe
Visual Receptor & Sensitivity	Recreational – high/medium
Existing View / Do Nothing Scenario	The viewpoint is situated on the verge alongside the N72 (S14 Scenic Route) near the junction with the L1206. The view looks across the N72 carriageway with a grass verge and scrub in the foreground. In the middle ground is bare soil of a tilled field and beyond the ground rises slightly to mature hedges and woodland. A timber pole transmission line is visible crossing the middle ground. The overall view composition is simple.
Predicted view	The proposed development would not be visible. Views of turbines, met mast and substationwould be screened by intervening vegetation and landform.
Scale of landscape change	The proposed development would not be visible and the scale of landscape change would be Negligible.
Scale of visual change	The proposed development would not be visible and the scale of visual change would be Negligible.

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CHAPTER 14 – LANDSCAPE AND VISUAL

Appendix 14.4: Landscape Sensitivity Assessment

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APPENDIX 14.4: LANDSCAPE SENSITIVITY ASSESSMENT

The sensitivity of the host landscape character type (LCT) which may receive significant landscape effects is assessed below. Landscape sensitivity is not absolute and can only be defined in relation to each development and its location. To assess the sensitivity of a particular landscape it is good practice to consider the value attached to the landscape and its susceptibility to the particular form of change likely to result from the proposed development. Assessment text relates to sensitivity of the landscape receptor as a whole, to the proposed development, with additional comments regarding the Site where relevant. In the main this has been taken from the County Cork Draft Landscape Strategy Landscape Character Assessment (quotes shown in italics) as well as from local sources and site assessment. The table below is based on guidance provided within LI TGN 02/21 - specifically table 1 within that document.

Host Landscape: Fertile Plain with Moorland Ridge LCT

Factors affecting sensitivity	Lower Sensitivity to Wind Energy	Higher Sensitivity to Wind Energy	Explanation	Judgement
Value attached to Landscapes				
Designated scenic quality	No specific designation	National or regional designation	A High Landscape Value Area (HLVA) coincides with the eastern part of the LCT.	Regional
Natural Heritage	Low presence of ecological or geological / geomorphological interest.	High presence of ecological or geological / geomorphological interest.	Blackwater River Special Area of Conservation (SAC) is the main site of ecological interest with Kilcolman Bog Special Protection Area (SPA) to the east of Buttevant.	Regional
Cultural Heritage	Low presence of archaeology or historical interests	High presence of archaeology or historical interests	There are numerous assets identified on the Sites and Monuments Record throughout the LCT.	Regional
Landscape condition/ quality	Landscape in a poor state of repair with incongruous elements	Landscape fully intact in good condition with limited incongruous elements	The landscape is in good condition with although this varies throughout the LCT and the LVIA study area. Hedgerows have been lost through field enlargement and there is sporadic housing development throughout the rural parts of the LCT. There are operational wind farms in the north of the LCT at Boolard, Rathnacally, Knocknatallig and Castlepook.	Regional
Cultural associations	No strong associations with notable people, events or the arts.	Strong cultural associations with notable people, events or	There are numerous cultural associations within the Trent and Belvoir Vale, especially to the southern part of this LCA	Community

		the arts, which contribute to perceptions of natural beauty.		
Distinctiveness	Commonplace elements and features, or the landscape itself. Lacking distinctive and strongly expressed character and with no important relationship to a settlement.	Presence of rare elements or features or rarity of the landscape itself. Landscape with a distinctive and clearly expressed character and/or with an important relationship to a settlement.	While there is a distinctive and readily recognised character to the LCT it is commonplace.	
Amenity and recreation	Limited amenity/recreational function where experience of the landscape is important	Well used for recreation where experience of the landscape is important; or forms part of a view that is important to a recreational experience. May contain National Trails or other long distance routes.	Ballyhoura Way and Blackwater Trail run through this area as well as the network of PRoW.	Regional
Perceptual (Scenic)	Landscape with no particular scenic / visual appeal.	Landscape with strong appeal to the senses, particular visual.	The gently undulating topography with pasture fields bounded by matures hedges and the prevalence of woodland create a scenic appeal. The backdrop of hills contrast with the farmland plain contributing to the scenic qualities.	Community
Perceptual (Wildness and Tranquillity)	Busy with evidence of human activity, well-lit.	Remote, peaceful or with a sense of wildness. Dark skies.	There is a rural feel to the LCT and a peaceful character away from the N72 and N20 and regional roads.	Community
Function	No important blue/green infrastructure function or important relationship with national landscape designation.	Landscape with important blue/green infrastructure function or strong relationship that is important to a national landscape designation.	The Blackwater River has an important ecological function and the route of the Blackwater Trail passes within and nearby the valley.	Regional
Overall Judgement of Value				**Regional**

Susceptibility

Scale	Large scale landscapes where the turbines may be in proportion with the landscape are generally less sensitive.	Small scale intimate landscapes are generally more sensitive to large scale structures.	A large scale landscape when viewed from elevated areas and small to medium scale when viewed from the farmland plain.	Medium
Landform	Smooth regular flowing, flat or uniform landscapes	Dramatic, rugged and complex landscapes	'Low lying…predominantly flat or gently undulating.'	Medium/Low
Openness/enclosure	Open and exposed landscapes	Enclosed and sheltered landscapes	'Broad plain…even and vast extent.' A series of undulating ridges provide open views across the landscape while in the intervening troughs there is an enclosed character.	Medium
Land cover	Extensive areas of simple or regular landcover (including intensive farming and forestry)	Complex, intimate or mosaic cover	'fertile and verdant landscape well suited to intensive farming.' A mosaic of fields articulated by boundaries of mature broadleaf hedges.	Medium
Complexity and patterns	Simple and sweeping lines, linear feature and patterns	Complex or irregular patterns	'…rectilinear mosaic of large sized fields' and 'Occasional small blocks of coniferous plantations introduce a patch landcover pattern to hills and ridge tops.'	Medium/Low
Built Environment	Contemporary masts, pylons, industrial elements, buildings infrastructure, settlements	Established, traditional or historic built character	'Several large settlements are found within the area, including mallow, Charleville, Mitchelstown and Fermoy' 'Farmsteads are scattered throughout the landscape, comprising large houses, traditional barns, barrel shaped metal roofed sheds and slatted sheds with A-shaped roofs' Powerlines, the N72 and N20 ensure human influences.	High/medium
Views intervisibility	Visually contained and have limited inward or outward views	Extensive views within or of the area with distant horizons.	'views are curtailed by the prevalent tall hedgerows when viewed on the plain.' There are outward views to distant hills from broad ridges.	High/medium
Landscapes that form settings, skylines, backdrops, focal points	Generally low lying landscapes without distinctive landform or horizon	Areas with strong features, focal points that define the setting or skyline	Low lying landscape without distinctive landform	Medium/Low

Overall Judgement of Susceptibility	**Medium**
Overall Judgement of Sensitivity	**High/medium**

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CHAPTER 15– ARCHAEOLOGY AND CULTURAL HERITAGE

Appendix 15.1: Recorded Monuments

APPENDIX 15.1 – RECORDED MONUMENTS

Setting Impact Table National Monuments within 10 km and Protected Structures within 5 km of the Site Boundary

Name	Map No.	Nat. Mon. No./RPS No.	Townland	Dist. From Development	Location	Setting Impact Assessment
Blossomfort Ringfort	3	594	Blossomfort	3.2 km	Cork	Low Potential Visual effect, Reversible.
Kilmaclenine Castle	9	186	Kilmaclenine	0.85 km	Near Lisgriffin, West of Buttevant	Low Potential Visual effect, Reversible.
St. Mary's Catholic Church	108	42	Lisgriffin	1.8 km	Lisgriffin, West of Buttevant	Medium potential visual effect, Reversible
Lisgriffen Castle (in ruins)	7	41	Lisgriffin	2.1 km	Near Lisgriffin, West of Buttevant	Negligible potential visual effect, Reversible
Liscarroll Castle	1	333	Liscarroll	6.3 km	Cork	No change potential effect due to distance, topography, and existing vegetation, Reversible
Buttevant Abbey	2	202	Buttevant	5.7 km	Cork	Negligible potential visual effect due to distance, topography, and existing vegetation, Reversible
Dromaneen Castle	4	339	Dromaneen	7.1 km	Cork	No change potential visual effect due to distance,

Name	Map No.	Nat. Mon. No./RPS No.	Townland	Dist. From Development	Location	Setting Impact Assessment
						topography, and standing vegetation, Reversible
Mallow Castle	5	281	Castlelands	2.3 km	Cork	Negligible potential visual effect due to distance, topography, and standing structures, Reversible
Ballybeg	103-105	301	Ballybeg East	4.9 km	Cork	Negligible potential visual effect due to distance, topography, and existing vegetation, Reversible
Mountcorbitt House & Stables	106	38	Mountcorbitt	4.8 km	Near Buttevant	No change effect due to distance, and existing vegetation, Reversible
Dunbarry House	107	39	Bunbarry	4.2 km	Near Buttevant	No change effect due to distance, and existing vegetation, Reversible
Fortwilliam (Country House)	6	40	Ballygrady North	3.5 km	Near Kilbrin, North East of Kanturk	No change effect due to distance, topography, and existing vegetation, Reversible
The Abbey Columbarium	109	57	Ballybeg West	4.9 km	South of Buttevant	No change effect due to distance, topography, and

Name	Map No.	Nat. Mon. No./RPS No.	Townland	Dist. From Development	Location	Setting Impact Assessment
						existing vegetation, Reversible
St. John the Baptist Catholic Church	110	164	Knockballymartin	1.8 km	Kilbrin, Near Kanturk	No change effect due to existing vegetation and structures, Reversible
Marybrook House	111	171	Marybrook	4.6 km	Near Kanturk	No change effect due to distance, topography, and existing vegetation, Reversible
Ballyclogh Ornamental Tower	112	183	Ballyclogh	2.1 km	Near Ballyclogh, East of Kanturk	No change effect due to distance, topography, and existing vegetation, Reversible
Ballygiblin House (18th Century)	113	188	Ballygiblin	3.2 km	Near Cecilstown, North-west of Mallow	Negligible effect due to distance, topography, and existing vegetation, Reversible
Former Ballyhass National School	114	189	Ballyhass	4.2 km	Ballyhass, East of Kanturk	No change effect due to distance, topography, and existing vegetation, Reversible
Ballyclogh Castle	115	190	Ballyclogh	2.5 km	Ballyclogh	No change effect due to topography, and existing vegetation, Reversible

Name	Map No.	Nat. Mon. No./RPS No.	Townland	Dist. From Development	Location	Setting Impact Assessment
St. John the Baptist Catholic Church	116	191	Ballyclogh	2.7 km	Ballyclogh	No change effect due to topography, and existing vegetation, Reversible
Ballyclogh House	117	192	Ballyclogh	2.7 km	Ballyclogh	No change effect due to topography, and existing vegetation, Reversible
Former Church of Ireland	119	197	Ballyclogh	2.7 km	Ballyclogh, North-west of Mallow	No change effect due to topography, and existing vegetation, Reversible
Ballgrady School (Former)	8	41	Ballygrady South	2.9 km	Near Kilbrin, East of Kanturk	No change effect due to topography, and existing vegetation, Reversible
Thatch Cottage	121	580	Kilbarry	2.7 km	-	No change effect due to topography, and existing vegetation, Reversible
Copsetown Abbey	118	193	Copsetown	3.3 km	Near Ballyclogh	No change effect due to distance, topography, and existing vegetation, Reversible

Name	Map No.	Nat. Mon. No./RPS No.	Townland	Dist. From Development	Location	Setting Impact Assessment
Lohort Castle	10	196	Castleohort Demesne	4 km	Near Ceciltown, North-west of Mallow	Negligible effect due to distance, topography, and existing vegetation. Likely visible from the top of the tower, Reversible
Thatch House	120	580	Knockalohart	4.2 km	-	No change effect due to distance, topography, and existing vegetation, Reversible

National Monuments within 10km of the Site Boundary :

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
1	CO016-015001-	Liscarroll Castle	On limestone outcrop, overlooking flat rolling countryside to the North; Liscarroll village immediately to the South. Quadrangular ward enclosed by curtain walls, with circular flanking tower at each corner, central gate tower in the South wall and rectangular towers projecting from the North and West walls; all stand to full height except the South-East corner tower. Built of rubble limestone, with pronounced low base batter. Recent repairs evident throughout castle (see plan Leask 1937, opp. 93). Castle of the Barrys, dated by Leask (1937, 92, 94) to late 13th century, with subsequent 16th -century additions. Acquired by Sir Philip Percival in 1625 and held until recent times by his descendants (ibid., 92). Site of several 17th -century battles (Grove White 1905-25, vol. 4, 28-9).	333	Guardianship	6.3 km
2	CO017-053004-	Buttevant Abbey	In Buttevant town (14631), on the West bank of Awbeg River. Ruin of rectangular church divided by belfry tower into nave and choir; crypt on two levels under the East end of choir has been interpreted by O'Keeffe (2012) as a possible early castle or hall (see plans: Brash 1852a, opp. 88; Cochrane 1912, 67). Interior of church long used for burial (Fitzgerald 1904-6b) and densely packed with 18th, 19th and 20th century burials. Remains 'repaired' in 1851, after the tower had collapsed, when breaches in the North walls were built up, fallen debris was removed, and 'collected fragments of tombs and cut stone work built into the walls' (Brash ibid., 95-6; Fitzgerald ibid., 442). Buttevant is a Franciscan friary, founded c. 1251 by David de Barry (Gwynn and Hadcock 1988, 243); it	202	Ownership	5.7 km

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
			later became an important burial place for the Barrys. By the 16th century the conventual buildings were in ruins, but repaired in 1604 and subsequently re-inhabited by friars (ibid.). A ruin again by 1750, though some of the conventual buildings still stood at that time (Smith 1750, vol. 1, 313).			
3	CO024-129----	Blossomfort	In pasture, on a gentle East-North-East-facing slope. Circular area enclosed by an earthen bank; external fosse. Bank heavily overgrown; break to West-South-West. Fosse not visible South-South-West due to heavy overgrowth; infilled South-West. Interior grass-covered; slightly lower boggy area around edge North-North-West-South-East, with narrow gap in bank to North-East allowing water to drain from this area. Site inspection by OPW, in 1980, noted resent break in bank to the West and field clearance material dumped on defences to the South and West.	584	Ownership	3.2 km
4	CO032-097002-	Dromaneen Castle	Complex of ruined buildings atop cliff edge, over This enclosure is referred to in the 'Archaeological Inventory of County Cork - vol. 4 North Cork' (2000, 423-4) under the entry (no. 13758) for an enclosure (CO024-024----). The reference to the enclosure in the entry is as follows: Smaller circular enclosure (diam. c. 18m) abuts enclosure to E, defined by low bank with external fosse SSE->NW; on W side shares fosse with enclosure; break in bank to W and E; interior slightly undulating and sloping gently down to NE looking Blackwater River to the North, with large trapezoidal bawn on rising ground to the South. Complex consists of rectangular house (structure 1), with addition built against the West end of the South wall (structure 2), and another rectangular building (structure 3) c. 14m to E of house; linking these are series of low enclosing walls,	339	Ownership	7.1 km

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
			including entrance gateway c. 20m to the East of structure 3. Extensively repaired and partially rebuilt in 1940s by OPW. House of O'Callaghans (Grove White 1905-25, vol. 3, 61); said to have been constructed in early 17th century on site of the earlier castle (Smith 1750, vol. 1, 300); bawn described in 1897 as being 'of about six acres, which was all paved over up to recent times' (Grove White ibid., 64).			
5	CO033-009001-	Mallow Castle	On slight limestone eminence, overlooking bridge on Blackwater River c. 150m to S. Ruin of rectangular 3-storey house (int. 25m N-S; 8.3m E-W) with 4-storey towers projecting from NW and SW corners and from centre of E and W walls; former polygonal in plan, latter have straight sides and pointed front (see plan Leask 1944, plate 1). Fortified house built by Sir Thomas Norris who was granted Manor of Mallow during Munster plantation and who died in 1599 (Leask ibid., 24). Assaulted and ruined by Confederate forces in 1645 (Grove White 1905-25 vol. 4, 85).	281	Ownership	2.3 km
103	CO017-059003-	Ballybeg	Circular columbarium or dovecote (int. diam. 4.6m) to SE of church (CO017-059001-) entered via ground-floor door on W side. Interior wall face has continuous rows of nesting boxes (Wth 0.22m; H 0.2m; 32 boxes in each circuit), in 11 tiers up to height of c. 5m (see plan and section in Brash 1852b, 266-7). Above this, wall inclines gently inward for height of c. 2m, above which it is corbelled in steeply, leaving circular opening at top. High up on exterior wall face on N side lintelled door gives access to mural stairs leading to top of tower, possibly to wall-walk. Section of projecting masonry to E of door indicates wall extending N from	301	Ownership	4.9 km

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
			columbarium, probably with wall-walk, from which door was accessed.			
104	CO017-09002-	Ballybeg	Stump of rectangular tower (9m E-W; 6.8m N-S) to N of church (CO017-059001-) entered via door with three-centred arch near N end of W wall; ground-floor chamber (4.8m N-S; 3.3m E-W) lit by slit window in square-set embrasure in N wall and slit windows in double-splayed embrasures in E, W and S walls; attic overhead under wicker-centred vault (axis N-S); part of vault collapsed at S end. Original access to floor above vault uncertain. Garderobe chute exits at N end of E wall; immediately S of latter projecting masonry indicates remains of wall extending to E; similar masonry at N end of W wall indicates wall extending W from tower	301	Ownership	4.9 km
105	CO017-09001	Ballybeg	National monument in state guardianship no 301. In flat pasture, c. 200m S of Awbeg River. Complex of ruined 13th-century monastic buildings comprising church with cloister on S side (W end of church in line with mid-point of cloister) and claustral ranges to S, W and E (see plan Shine 1993, 108). Complex renovated in late-medieval period, when 4-storey rectangular tower built against N end of W claustral range and tower inserted into W end of church. Late-medieval rectangular tower (CO017-059002-), c. 70m to N, and columbarium (CO017-059003-), c. 25m to SE, also part of monastic complex. Church (int. 50.5m E-W; 8.2m N-S) best preserved at W and E ends; between these all of N wall is missing, and only fragments of S wall stand, much of this recently rebuilt. West end wall has rebuilt ground-floor doorway, near N end; rear-arch of embrasure built of well-cut sandstone blocks, some	301	Ownership	4.9 km

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
			with diagonal tooling. Overhead and in centre of wall is pair of windows: N light has rounded arch, S is bluntly pointed; though both lights separated by walling outside, inside the embrasures meet at a point where there is 'a banded shaft which bears a capital of foliage with three small human faces' (Leask 1960, vol. 2, 146; Leask (ibid.) dates these windows to late 13th century. High on W end of S wall is a wide window embrasure with segmental rear arch, light missing. Doorway and windows partially obscured by insertion of belfry tower within W end of church. Tower consists of four masonry piers raised to eaves level, supporting wicker-centred groin vault. SW pier contains spiral stairs which gives access to area over vault. Two carved animal heads on underside of vault have wide circular mouths which functioned as rope-holes. Carved human head (at level of springing of vault) on both western piers. Area over vault much ruined; at E end lower courses of square structure (L c. 2m) survive, this may be remains of bellcote as positioned directly above rope-holes. South wall of church has two doorways giving entry to N cloister walk: blocked doorway, partially obscured by SE pier of belfry tower, and second door 1.6m to E. Latter has pointed-arch door surround, facing into cloister, which is late-medieval in appearance, but doorway itself may be original. A further 5.2m to E of latter is W ingoing of slope, possibly a similar doorway but only surviving feature is chamfered jamb-stone on inside edge of base. Southeast corner of church stands to near full height, preserving S ingoing of E window and E ingoing of window in S wall; latter retains part of banded shaft.			

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
			Series of three semi-circular recesses in inner face of S wall 3.4m W of SE corner may be remains of sedilia. Stone-built burial chest immediately W of latter feature, on inside wall face. Pair of similar burial chests opposite in N wall (see plan Shine ibid.). East half of N side of cloister formed by S wall of church; W half is extensively rebuilt wall linking S wall of church to N wall of W claustral range. Corbels and roof flashing on exterior face of S wall of church indicate line of lean-to roof over cloister walk. West wall of cloister survives though reduced from original height; S wall missing. Doorways in E and W walls of cloister formerly gave access to claustral buildings, of which few traces remain but outline of W and S ranges discernible. Centrally placed on E side is base of elaborate doorway (Wth 2m) facing into cloister, identified by Leask (1960 vol. 2, 146) as entrance to chapter house; each side consists of base of three rounded engaged pillars, in line, inside jamb with round filleted moulding at either edge. To N and S of doorway, and 3.35m from it, vertical scar on outside face of wall probably marks side walls of chapter house; otherwise, no remains of claustral range on this side. Vaulted passage (L c. 8m) extends S from SE corner of cloister walkway. Broken masonry protruding to W from N end of passage indicates line of S wall of cloister. Low wall running W from S end of passage; probably base of S wall of refectory; short flight of mural stairs may have led to pulpitum. Masonry block with stone shelf at SW corner of cloister identified by Leask (ibid., 146) as remains of laver; this stone reset in present position by OPW. Outside NW corner of			

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
			cloister, c. 18m W of church, is late-medieval 4-storey rectangular tower. Tower entered via lintelled ground-floor doorway at N end of E wall; lobby (1m x 1m) inside, from which mural stairs leads S to 1st-floor, and lintelled door leads W to ground-floor chamber (3.9m N-S; 3m E-W). Latter lit by double-splayed window embrasures in N and W walls; corbels overhead indicate wooden floor. Door at top of mural stairs leads to 1st-floor chamber; latter lit by slit windows in N and W walls. Vault (long axis N-S) overhead. From 1st-floor level spiral stairs rise in SE corner to 3rd floor. Second-floor mural chamber in E wall accessed from spiral stairs; chamber (1.2m E-W; 3.1m N-S) roofed by vault (long axis N-S). Single chamber (4.6m E-W; 4.8m N-S) on 3rd floor; vaulted splayed window embrasure in E wall has single cusped ogee-headed light; similar embrasure in N wall has twin cusped ogee-headed light, mullion missing; N ingoing of embrasure with window seat survives in W wall. Traces of spiral stairs rising from this chamber in SE corner. Walls collapsed above this level. Stump of rectangular tower (9m E-W; 6.8m N-S) to N of church entered via door with three-centred arch near N end of W wall; ground-floor chamber (4.8m N-S; 3.3m E-W) lit by slit window in square-set embrasure in N wall and slit windows in double-splayed embrasures in E, W and S walls; attic overhead under wicker-centred vault (axis N-S); part of vault collapsed at S end. Original access to floor above vault uncertain. Garderobe chute exits at N end of E wall; immediately S of latter projecting masonry indicates remains of wall extending to E; similar masonry at N end of W wall			

Map No	RMP No.	Name	Description	Nat. Mon. No.	Legal Status	Dist. From Development
			indicates wall extending W from tower. Circular columbarium (int. diam. 4.6m) to SE of church entered via ground-floor door on W side. Interior wall face has continuous rows of nesting boxes (Wth 0.22m; H 0.2m; 32 boxes in each circuit), in 11 tiers up to height of c. 5m (see plan and section in Brash 1852b, 266-7). Above this, wall inclines gently inward for height of c. 2m, above which it is corbelled in steeply, leaving circular opening at top. High up on exterior wall face on N side lintelled door gives access to mural stairs leading to top of tower, possibly to wall-walk. Section of projecting masonry to E of door indicates wall extending N from columbarium, probably with wall-walk, from which door was accessed. Fish-pond (CO017-057003-) in grounds of country house c. 550m to ENE known locally as 'Monk's Pond', may have been associated with priory; also probably associated with site is clapper bridge (14839) over river c. 450m to NW, and series of earthworks (13824) in field bounding S side of river immediately NE of complex. Augustinian Priory, founded by Philip de Barry in 1229 and dedicated to St Thomas (Gwynn and Hadcock 1988, 159). Dissolved in 1541, possibly re-established for a time (ibid., 153). In ruins by 1750 (Smith 1750, vol.1, 316); centre and W end of church subsequently occupied by farmhouse and out offices until early in this century (Grove White 1905-25 vol. 1, 121).			

Site and Monument Records within 1km of the Site Boundary :

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
49	CO024-206----	548031	604897	Fragmented pattern of rectilinear cropmarks, some perpendicular to each other, visible in aerial photographs (CASAP, July 1989). Cropmarks cover area of c. 20ha and indicate relict field system on different axis from present system; some rectangular fields visible. Enclosures (CO024-09001-; CO024-09002-) and circular enclosure (CO024-207---) within field system. Linear series of possible pits (CO024-216---) to NE.	CO03338
50	CO024-207----	548129	605011	Cropmark of fosse of roughly circular enclosure (diam. c. 30m) visible in aerial photograph (CASAP, July 1987). Within field system (12003).	CO03339
51	CO024-021----	547755	607211	In pasture, on gentle WNW-facing slope. Depicted as hachured circular enclosure (diam. c. 18m) on 1842 and 1905 OS 6-inch maps; as hachured circular raised area (diam. c. 15m) on 1937 OS 6-inch map. Circular area (18m E-W; 17m N-S) enclosed by earthen bank (int. H 0.17m; ext. H 1.5m) E-NNW; scarp (H 0.5m) NNW-N; scarp (H 0.6m) with slight internal lip N-E. External fosse survives as slight depression. Entrance (Wth 5m) to SSE. One-third of interior on N side at lower level and separated from remainder by ill-defined scarp.	CO03118
52	CO024-023----	547280	606245	In boggy ground. Low mound of burnt material (6m NE-SW; 6m NW-SE).	CO03120
53	CO024-024----	547514	606157	In pasture, just below brow of gently rolling hill. Pear-shaped area (86m E-W; 58m N-S) defined by nearly levelled earthen bank (int. H 0.5m; ext. H 0.8m) with shallow external fosse. Short length of bank	CO03121

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				incorporated into or replaced by earthen field boundary on W side; very low inner height of bank ENE->SW. Interior undulating; boggy area (34m N-S; 18m E-W) in NE quadrant defined on W side by low bank. Linear bank (H 0.5m) extends from SW bank for c. 22m in SW direction to field boundary; fosse (D 0.5m) at S side of bank. Smaller circular enclosure (diam. c. 18m) abuts enclosure to E, defined by low bank with external fosse SSE->NW; on W side shares fosse with enclosure; break in bank to W and E; interior slightly undulating and sloping gently down to NE. Annexes accreted on NW and NE side of enclosure, mainly defined by low bank and external fosse and sharing fosse of main enclosure; NW annexe roughly D-shaped (straight side c. 27m NE-SW; projecting c. 19m to NW); N annexe roughly sub rectangular (20m E-W; 14m N-S); NE annexe roughly sub rectangular (16m NE-SW; 30m NW-SE). A fourth annexe (20m N-S; 24m E-W) adjoins N side of NW annexe; at W side of interior is possible fulacht fiadh (11760). Remains of similar enclosure (13724) in Ballyphilibeen townland c. 6.8km to SW.	
54	CO024-025----	547614	606115	In tillage, on gentle NE-facing slope. Depicted as hachured circular enclosure (diam. c. 12m) on 1842 OS 6-inch map; bisected off-centre to SW by townland boundary. Levelled; no visible surface trace.	CO03122
55	CO024-027----	547410	605657	Depicted as hachured square area (c. 20m N-S; c. 20m E-W) on 1842 OS 6-inch map; hachured oval raised area on 1905 and 1937 OS 6-inch map, surrounded by fosse, with leat extending c. 50m S to field boundary; E and S	CO03124

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				sides of fosse and leat shown as waterfilled, small square field (c. 20m N-S; c. 20m E-W) indicated to S of fosse and W of leat. According to local information, enclosing bank levelled in early 1970s and fosse infilled with rubble. In pasture, on gentle E-facing slope. Rectangular area (19m E-W; 16m N-S) enclosed by shallow fosse (Wth 3.5m; D 0.25m); shallow, wet, leat extends S from SE corner of moat. Visible in aerial photograph (CASAP) as cropmark of wide fosse, enlarged at SE corner, with fosse (leat) extending c. 45m S, from SE corner to field boundary. Short distance to S a second fosse extends W from leat for c. 90m, turns at right angle and extends N for c. 45m where it is truncated by modern farm trackway. Secondary fosses to S and W of moated site may form part of a waterway system or may be part of a larger moated enclosure. Numerous linear features visible as cropmarks of fosses (CASAP) in same field to E of moated site; including a wide laneway (Wth c. 10m; L c. 75m) on NE-SW axis, the SW end of which is indicated on 1842, 1905 and 1937 OS 6-inch maps. Modern farm trackway, extending from road to S, cuts through above cropmarks and curves outside NE corner of moat to continue W along S side of field boundary. According to Grove White (1905-25, vol.4, 242), 'the ''Batteries''...are supposed to have been erected during some of the wars of the 17th century.' Second moated site (14205) c. 500m to ENE. Listed by Barry (1981, 83, no. 36).	

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
56	CO024-030----	547898	605888	Depicted as hachured square enclosure on 1842 and 1905 OS 6-inch maps, at NW corner of field, with hachured external fosse on 1905 OS 6-inch map, skirted by field boundary all round; as hachured square raised area (c. 25m N-S; c. 25m E-W) enclosed by fosse and skirted by field boundary (c. 45m N-S; c. 45m E-W), with well at S end of E side on 1937 OS 6-inch map. According to local information, levelled in late 1960s. In level pasture. No visible surface trace of inner bank. On E side, shallow intervening fosse survives with substantial outer earthen bank (int. H 2m) and waterlogged external fosse (D 1m). On S side, outer bank survives at E end (L c. 2m.). Remainder of S, W and N banks survive as low rise with shallow external depression. Remaining upstanding bank incorporated into field boundary system. Levelled moated site (14204) lies c. 500m to WSW. Listed by Barry (1981, 83, no. 37).	CO03127
57	CO024-031----	548272	606783	In marshy pasture. Roughly horseshoe-shaped mound of burnt material (30m NE-SW; 13m NW-SE); opening (Wth 4.5m) faces W.	CO03128
58	CO024-032001-	548568	606734	In level pasture. Depicted as hachured circular enclosure (diam c. 30m) on 1842 OS 6-inch map; as hachured arc showing scarp SSW->E on 1937 OS 6-inch map. Circular area (c. 24m N-S; c. 24m E-W) defined by slight scarp, except to S and SE; fosse survives as slight external depression. Souterrain (CO024-03202-) in interior. According to local information, ringfort	CO03129

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				levelled c. 1928 (UCC). Circular enclosure visible as cropmark of fosse, causeway to SE, in aerial photograph (CASAP).	
59	CO024-032002-	548568	606734	In ringfort (CO024-03201-). Discovered in 1958 when roof collapsed; investigated by M.J. O'Kelly (UCC). According to McCarthy (1977, 214), comprised at least two stone-built corbelled chambers. Chamber 1: (L 3.75m; max. Wth 1.5m; H 1.25m; long axis N-S); slightly wider at centre than ends; floor covered with stones and collapsed soil from roof; layer of dark soil (D 0.2m-0.4m) beneath collapsed material; creepway, framed with lintel and stone jambs, at N end to chamber 2. Chamber 2 (long axis N-S) filled with soil; not explored. Charcoal and animal bones found at N end of chamber 1. No visible surface trace.	CO03130
60	CO024-033----	548371	606319	In level pasture. Depicted as hachured circular enclosure (diam. c. 25m) on 1842 OS 6-inch map; as hachured circular depression (diam. c. 25m) on 1937 OS 6-inch map. Levelled; no visible surface trace. According to local information, when silage grass is cut, circular slightly raised platform (diam. c. 20m) visible and fine, orange coloured soil exposed on ploughing. Fosse visible as cropmark in aerial photograph (CASAP, July 1989).	CO03131
61	CO024-034----	548425	606129	In tillage. Barely perceptible mound of burnt material (24m E-W; 14m N-S).	CO03132

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
62	CO024-035----	549113	606520	Not marked on 1842 and 1905 OS 6-inch maps. In level pasture. Stone (H 1.45m; 1.3m x 1.1m) is subcircular in plan, tapering to point at top.	CO03133
63	CO024-036----	549397	606210	In pasture, on NW-facing slope. Circular area (28.5m E-W; 26.5m N-S) defined by low rise (H 0.3m), with slight trace of external fosse as shallow depression. Possible entrance to W. Locally known as site of fort.	CO03134
64	CO024-037----	549451	605784	In marshy pasture. Low, roughly semi-circular mound of burnt material (18m NE-SW; 14m NW-SE; H c. 0.4m).	CO03135
65	CO024-050----	550040	606230	In undulating pasture, broken by rock outcrop; Kilmaclenine Castle (14332) in view to SE. Depicted as hachured roughly circular enclosure (diam. c. 55m) on 1842 OS 6-inch map; as hachured penannular enclosure (NW->SW) on 1905 and 1937 OS 6-inch maps. Roughly circular area (34m E-W; 30m N-S) defined by two low grass-covered earthen banks N->WSW and scarps WSW->W, separated by intervening fosse; second intervening fosse and third low earthen bank N->W; shallow external fosse N->W. Immediately to NW and defining enclosure on NW side is roughly linear rock face (facing SE) c. 2.5m H. Break in inner (Wth c. 4m) and outer (Wth c. 1.5m) banks to SW; middle bank barely traceable E->SW. Interior surface broken by rock out crop; uneven due to quarrying; c. 9m inside rock face is ill-defined low rise, which may suggest that inner bank formed complete circle. To WSW, low wide linear bank extends WSW from bank for c. 10m.	CO03149

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
66	CO024-051----	549898	605930	In pasture, on gentle NW-facing slope. Depicted as circular depression (diam. c. 40m) on 1937 OS 6-inch map, bisected off centre to NE by field boundary; arc formed by hachured bank survives on 1842 and 1905 OS 6-inch map, to SW of field boundary; field boundary hachured on 1842 OS 6-inch map, as if forming part of enclosure. Circular area (32m NNW-SSE) enclosed by shallow fosse; best preserved ESE->W. Interior on NE side cut by field boundary running NNW->SSE. Deep drain cut along both sides of field boundary. Well depicted, immediately to N of enclosure, on all three editions of OS 6-inch map.	CO03150
67	CO024-091001-	548760	605073	In pasture. Spread of burnt material (12m N-S; 8m E-W). Ringfort (12899) immediately to ESE	CO03201
68	CO024-090001-	548118	604691	In pasture. Spread of burnt material (12m N-S; 8m E-W). Ringfort (12899) immediately to ESE	CO03199
69	CO024-090002-	548118	604691	Cropmark of fosse of large subcircular enclosure (diam. c. 60m) visible in aerial photograph (CASAP, 1984); truncated by laneway and field fence on W side. East side overlaps with smaller enclosure (13711). Arc of second concentric outer fosse noted at E side in area of overlap. Within field system (12003).	CO03200
70	CO024-091002-	548798	605077	Cropmark of fosse of large subcircular enclosure (diam. c. 60m) visible in aerial photograph (CASAP, 1984); truncated by laneway and field fence on W side. East side overlaps with smaller enclosure (13711). Arc of	

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				second concentric outer fosse noted at E side in area of overlap. Within field system (12003).	
71	CO024-092----	548372	604782	In pasture, on SE side of stream. Barely perceptible mound of burnt material (15m ENE-WSW; 10m NNW-SSE). Burnt material visible in section in drain which cuts through NW side of mound.	CO03203
72	CO024-093----	548502	604632	Not marked on 1842 and 1905 OS 6-inch maps. In pasture, on gentle W-facing slope. Stone (H 1.7m; 0.8m x 0.8m) is irregular in plan and leaning slightly to SSW, long axis NE-SW.	CO03204
73	CO024-094----	548649	604515	In tillage, on gentle W-facing slope. Depicted as hachured multivallate oval enclosure (c. 40m N-S; c. 30m E-W) on 1842 OS 6-inch map, with lime kiln at centre; as hachured arc formed by central raised area enclosed by fosse WSW->ESE on 1937 OS 6-inch map, with S portion removed by quarry. According to local information, interior enclosed by two banks and levelled c. 1967. Circular slightly raised platform survives, defined by shallow fosse with external low-rise SSW->SE; quarry extends into S half of interior. Circular bivallate enclosure visible as cropmark of two fosses in aerial photograph (CASAP), quarried into to S	CO03205
74	CO024-095----	548851	604654	In pasture. Low, kidney-shaped mound of burnt material (30m NE-SW; 18m NW-SE); opening faces NW.	CO03206
75	CO024-096----	549141	604463	In tillage, on SE-facing slope. Depicted as lozenge-shaped hachured enclosure on 1842 OS 6-inch map; as hachured arc showing semi-circular fosse (diam. c.	CO03207

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				50m) WSW->ESE on 1905 and 1937 OS 6-inch maps. Levelled; roughly circular area (27m E-W; 25m N-S) defined by scarp (max. H 0.5m); shallow external fosse. Interior slopes down to SSE. Subcircular/oval enclosure visible in aerial photograph (CASAP), as cropmark of fosse with entrance to N. Based on cartographic evidence only, site was included in Barry's (1981, 83, no. 28) list of moated sites for County Cork. Linear cropmark extending NE from E side of enclosure and turning at right angle into next field to N may be levelled field boundary. Other linear cropmarks noted immediately to S and E. Enclosure (13749) in E half of same field.	
76	CO024-165----	549237	606517	Cropmark of bank and external fosse forming SW, NW and NE sides of rectangular enclosure, visible in aerial photograph (GSIAP, R528-9, July 1975); SE side unclear, possibly open.	CO03294
77	CO024-166----	549251	604523	Irregular complex of cropmarks covering E half of field, visible in aerial photographs (CASAP, July 1989; GSIAP, R528-9, July 1975). Cropmark of fosse of irregular enclosure (c. 100m N-S; c. 50m E-W) abutting W side of field fence; at least one linear cropmark crosses interior on NW-SE axis; E side of enclosure possibly truncated by field fence. Cropmark of two closely spaced linear fosses extends a short distance W from W side of enclosure, turns roughly NW and then E to join NW corner of enclosure; at this point, the inner of the two fosses merges for a short distance with the fosse of the enclosure; the cropmarks then diverge from the	CO03295

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				enclosure and extend to NE, terminating at field fence. Circular enclosure (13537) in NW corner of same field.	
78	CO024-174----	548748	606831	Listed as a 'potential site-cartographic' in the SMR (1988) and as a 'natural feature' in the RMP (1998). Hachured as a circular enclosure on 1842 OS 6-inch map; depicted as a pond on 1905 and 1937 OS 6-inch map. Fieldwork, carried out in 1987, confirmed that this is a pond and is not an archaeological monument.	CO03304
79	CO024-209----	548631	606483	Cropmark of fosse of small circular enclosure (diam. c. 15m) visible in aerial photograph (CASAP, July 1989).	CO03341
80	CO024-210----	549890	606538	Cropmark of fosse of roughly oval enclosure (diam. c. 40m) visible in aerial photograph (CASAP, July 1989); possible entrance to SE.	CO03342
81	CO024-216----	548404	605145	Roughly L-shaped series of at least 10 circular maculae, visible as cropmarks in aerial photograph (CASAP, July 1989), extending N-S for c. 200m in centre of field; shorter extension to W at N end. Maculae (diam. c. 10m) morphologically similar to those at Conva (13854) which, when excavated, revealed pits. Two parallel linear cropmarks c. 100m apart, possibly levelled field boundaries, cross field in NW-SE direction.	CO03348
82	CO024-218----	548186	606728	Cropmark of fosse of roughly circular enclosure (diam. c. 40m) on E side of field fence, visible in aerial photograph (CASAP, July 1989). Fosse bulges outward slightly to W, possibly an entrance feature. Within field system (12020).	CO03350

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
83	CO024-219----	547872	606325	Cropmark of arc of fosse (NNW->SSE) on ENE side of field fence (NNW-SSE) visible in aerial photograph (CASAP, July 1989). Probably part of circular enclosure (diam. c. 40m). Rectangular enclosure (14274) c. 100m to N.	CO03351
84	CO024-222001-	548342	604515	Incomplete cropmark of fosse of large enclosure visible in aerial photograph (CASAP, July 1989), abutting NW side of field fence (NE-SW). Visible portions of SW (L c. 110m) and NE (L c. 40m) sides are linear and linked by gently curving arc (c. 260m) on NW side. Circular enclosure (13538) inside perimeter in NW quadrant shares fosse for short distance along NW side; cropmark of small circular enclosure (diam. c. 10m) also inside perimeter at W corner.	CO03354
85	CO024-222002-	548262	604555	Cropmark of fosse of roughly circular enclosure (diam. c. 40m) visible in aerial photograph (CASAP, July 1989); within perimeter of larger enclosure (13750) and sharing short section of its fosse along W side.	CO03355
86	CO024-224----	549043	604361	Faint cropmark of arc of fosse (N->S) abutting E side of field fence (N-S), visible in aerial photograph (CASAP, July 1995). Circular enclosure (13537) c. 80m to NE.	CO03357
87	CO024-230----	547483	606245	Within W side of enclosure (10816). Grass-covered horseshoe-shaped mound (16m N-S; 13m E-W; H c. 0.65m); opening (Wth 4m) faces W. Mound composed of charcoal-enriched soil though no burnt stones observed. Shape of mound characteristic of fulacht fiadh.	CO03363

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
88	CO024-234----	548323	606513	Series of rectilinear cropmarks, some perpendicular to each other, covering area of c. 6ha, visible in aerial photographs (CASAP, July 1989). Circular enclosures (CO024-218---; CO024-239---) within field system.	CO03367
89	CO024-237----	548092	606295	Cropmark of fosse of small circular enclosure (diam. c. 10m) visible in aerial photograph (CASAP, July 1989). Possible circular enclosure (CO024-219---) c. 170m to NW.	CO03370
90	CO024-238----	547822	606485	Cropmark of fosse of rectangular enclosure (c. 12m N-S; c. 25m E-W) visible in aerial photograph (CASAP, July 1989). Linear cropmarks of possible field boundaries in same field.	CO03371
91	CO024-239----	548456	606490	Cropmark of fosse of roughly oval enclosure (diam. c. 25m) visible in aerial photograph (CASAP, July 1989). Within field system (12020).	CO03372
92	CO024-244----	549644	605778	In pasture, immediately E of a field boundary and 90m W of another possible burnt mound (CO024-246----). A spread of heat-shattered stones and charcoal-enriched soil was visible under the grass but its extent was impossible to determine.	CO18555
93	CO024-246----	549717	605843	In tillage, adjacent to the townland boundary between Kilmaclenine and Ardskeagh. A spread (10m x 4m) of heat-shattered stones and charcoal-enriched soil. Another possible burnt mound (CO024-244----) lies c. 90m to the E.	CO18557

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
94	CO024-024001-	547484	606157	This linear earthwork is referred to in the 'Archaeological Inventory of County Cork - vol. 4 North Cork' (2000, 423-4) under the entry (no. 13758) for an enclosure (CO024-024----). The reference to the linear earthwork in the entry is as follows: Linear bank (H 0.5m) extends from SW bank for c. 22m in SW direction to field boundary; fosse (D 0.5m) at S side of bank.	CO18819
95	CO024-024002-	547514	606157	This enclosure is referred to in the 'Archaeological Inventory of County Cork - vol. 4 North Cork' (2000, 423-4) under the entry (no. 13758) for an enclosure (CO024-024----). The reference to the enclosure in the entry is as follows: Smaller circular enclosure (diam. c. 18m) abuts enclosure to E, defined by low bank with external fosse SSE->NW; on W side shares fosse with enclosure; break in bank to W and E; interior slightly undulating and sloping gently down to NE.	CO18820
96	CO024-026----	547162	605605	n pasture, below top of ridge, on SW-facing slope. Circular area (29m N-S; 29m E-W) enclosed by three earthen banks with intervening fosses; shallow external fosse to SW. Inner bank (int. H 0.9m; ext. H 1.85m) planted with mature deciduous trees. Middle bank (H 0.85m) separated from inner bank by wide flat-bottomed fosse (D 0.55m), overgrown with trees. Second fosse and outer bank (H 0.55m) survive ENE->NNW. Narrow break in inner bank to NNW and in middle bank to SSW. Field fence, running N-S, crosses enclosure off-centre to E; where field fence cuts through banks, gap exists on both sides.	CO03123

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
97	CO024-068----	547555	605338	In pasture, on gentle NNW-facing slope above Awbeg River. Circular area (diam. c. 45m) defined by three earthen banks with intervening fosses; shallow external fosse to NE. Inner bank (int. H 0.2m; ext. H 0.9m) SE->SW; scarp to N. Middle bank (int. H 0.9m) broken to NW (Wth 3m) and NNW (Wth 3m). Outer bank (H 0.7m) low NW->NNE, with break to NW (Wth 2.5m) and NNW (Wth 6m). Banks to W and interior heavily overgrown and inaccessible. Bank depicted as forming continuous spiral from interior outwards on 1842 OS 6-inch map. According to Bowman (1934, 424), Lisatouragh 'more probably means Lios na Teamhrach - Fort of the Royal Palace'; he described triple ramparted fort with annexe to N (21yd x 19yd); foundations of hut sites, visible as grass-covered mounds, in interior.	CO03125
98	CO024-029----	547653	605222	Listed as a 'quarry' in the SMR (1988) and the RMP (1998). The evidence is not sufficient to warrant accepting this as the location of an archaeological monument.	CO03126
99	CO024-052002-	550390	606181	On limestone ridge, with extensive views in all directions. East end of ridge fortified by random-coursed limestone rubble walls (H c.1m-1.5m; T 1.3m) enclosing subrectangular area (c. 40m E-W; c. 30m N-S). Wall follows cliff edge on N, E and much of S sides; sections of wall missing at SW corner and on E side. Angular projection or spur at E end of N wall, with rectangular lintelled ope (H c. 0.5m; Wth c. 0.2m), not now accessible from interior; similar ope at E end of S	CO03152

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				wall, also blocked. Ramp (Wth 3m) leading up to site at W end of S wall may have been entrance; now grass-covered with sheer cliff-face on each side. Rectangular projection from N wall (2m N-S; 1.6m E-W), probably garderobe chute. Interior uneven with rock outcropping; no surface trace of any structures. Medieval castle of the manor of Kilmaclenine, possession of the Bishops of Cloyne (MacCotter and Nicholls 1996, 29, 37). Deserted rural borough (14638) c. 100m to SSE; church and burial ground (14434, 14594) c. 250m to SE; fortified house (14376) c. 90m to NNE.	
100	CO024-052004-	550568	605950	In level pasture. Within early ecclesiastical enclosure (13883); deserted rural borough (14638) immediately to W. Depicted on 1842 OS 6-inch map as rectangular area (c. 50m NNE-SSW; c. 40m WSW-ENE) enclosed by field fence to S, W and N, and defined by broken line to E; shown on 1905 and 1937 OS 6-inch maps as small area (c. 15m NNW-SSE; c. 20m WNW-ENE) to S and immediately E of church, enclosed by broken line, with field fence to W. Subrectangular graveyard (25m E-W; 15.5m N-S), delimited by ruin of parish church of Kilmaclenine (14434) to N and enclosed by low, wide bank of earth and stone to E (L 6.6m), by shallow fosse (D 0.5m; Wth 2.8m) to S and by earthen field boundary to W. No gravemarkers evident. Caulfield (1882, 12) noted 'cemetery' used only for burial of unbaptised children; an account of 1881 (Grove White 1905-25, vol. 3, 316) describes graveyard as unenclosed, only	CO03154

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				distinguishable from surrounding fields by moss-grown 'rude stones', and long disused.	
101	CO024-052005-	550558	605965	Forming N side of graveyard (14594), within early ecclesiastical enclosure (13883); deserted rural borough (14638) immediately to W. Fragmentary remains of church comprising of nave (int. 15m E-W; ext. 8.66m N-S) and chancel (4.4m E-W; 4.6m N-S). Walls of chancel mostly visible as stony band with a drop (c. 0.4m) on the outside; external facing stones visible in parts. At W end of chancel, drop (H c. 0.35m) marks junction with nave. Southeast corner of nave stands (int. H 3m) with short returns of E (L 1.9m) and S (L 2.3m) walls; S wall survives elsewhere at foundation level alone apart from short length (L 3.1m) at W end. North wall survives only to foundation level. Most of W gable stands to a maximum height of 6-8m, heavily ivy-grown; quoins at SW corner are massive; two recent breaches at base of wall. Caulfield (1882, 12) noted entrance and small window 'high up' in S wall; Grove White (1905-25, vol. 3, 317) noted in 1907 that chancel walls (8ft length then standing) were thinner than those of nave and which appeared to be an addition. Remains of parish church of Kilmaclenine, which served nearby borough. A 'road leading to the church' and 'cemetery' is mentioned in 1364-5 (MacCotter and Nicholls 1996, 46-7); according to Grove White (1905-25, vol. 3, 316) a north-south road, which 'evidently led towards the old church' traceable for a distance of 'about 150yards' in field 'about 230 yards' S of church,	CO03155

Map Id	SMR	ITM E	ITM N	Type Td.	WTG ID
				'roadway was about 8 to 10 feet wide'. Church reported 'in ruins' in 1591 (Brady 1863, vol. 2, 272).As a result of serious storm damage in February 2014, the entire west wall of the church collapsed leaving stones scattered within the interior.	
102	CO024-053----	550547	605357	In tillage. Discovered in 1973 and investigated by Twohig (1976, 23-4). Collapse in centre of roof allowed access to roughly rectangular stone-built chamber (L 3.6m; Wth 1m; H 1m; long axis E-W); roofed with limestone lintels, six in situ; side walls corbelled. Floor of limestone bedrock showed evidence that it had been chipped away in an attempt to level it. Stone-filled shaft at W end, leading towards surface, was possibly original entrance. No visible surface trace.	CO03155
124	CO024-240----	550152	606466	Faint cropmark of bank of possible circular enclosure (diam. c. 40m) on N side of field fence, visible in aerial photograph (GSIAP, R528). Field fence curves slightly in area of site.	CO03373

Record of Protected Structures within 5km of the Site Boundary:

MAP ID	RPS No.	Structure	Td.	RMP Ref
6	40	Fortwilliam (Country House)	Castlelohort Dem	-
7	41	Lisgriffen Castle (in ruins)	Mountcorbitt	CO016-179
8	187	Ballygrady School	Dunbarry	CO024-227
9	186	Kilmaclenine Castle	Lisgriffin	CO024-05202
10	196	Lohort Castle	Ballybeg West	CO024-126
106	38	Mountcorbitt House & Stables	Knockballymartin	CO016-116
107	39	Dunbarry House	Marybrook	-
108	42	St. Mary's Roman Catholic Church	Ballyclogh	-
109	57	The Abbey Columbarium	Ballygiblin	CO017-05901
110	164	St John the Baptist's Catholic Church	Ballyhass	-
111	171	Marybrook House	Ballyclogh	CO023-109
112	183	Ballyclogh Ornamental Tower	Rathnee	CO024-163
113	188	Ballygiblin House (18th Century)	Ballyclogh	CO024-084
114	189	Former Ballyhass National School	Copsetown	-

MAP ID	RPS No.	Structure	Td.	RMP Ref
115	190	Ballyclogh Castle	Knocalohert	CO024-135
116	191	St. John the Baptist Catholic Church	Kilbarry	-
117	192	Ballyclogh House	Ballygrady North	-
118	193	Copsetown Abbey	Lisgriffin	-
119	197	Former Church of Ireland	Ballygrady South	CO024-13602
120	580	Thatch House	Kilmaclenine	CO061-290
121	29	Thatch Cottage	Kilbarry	CO024-242

NIAH Structures within 5km of the Site Boundary:

MAP ID	NIAH	ITM E	ITM N	Structure	Td.	WTG
12	20901606	545189.9855	609097.6164	Lackeel House	Ballygrady	CO03338
13	20901608	548627.8678	608377.8378	Saint Mary's Church	-	CO03339
14	20901610	552237.2962	609086.7896	Glenville House	Buttevant	CO03118
15	20901611	550881.7135	609387.0766	Bregoge House	-	CO03120
16	20901612	550649.2108	609707.5976	Tullig House	-	CO03121
17	20901612	550699.8318	609938.9858	Tullig House	-	CO03122
18	20901614	550003.3624	610051.98	Curraghmount House	-	CO03124
19	20901614	550033.3576	609953.7533	Curraghmount House	-	CO03127
20	20901615	549840.0148	609958.1402	Curraghmount House	-	CO03128
21	20901621	543930.682	608061.7929	-	-	CO03129
22	20901624	548956.3898	608269.986	-	-	CO03130
23	20901625	550108.9259	609965.8775	-	-	CO03131
24	20902308	543076.6433	606973.5303	Church of Saint John the Baptist	-	CO03132
25	20902309	543353.8848	604896.8198	Marybrook House	-	CO03133
26	20902401	548958.1267	602157.2375	Ard na Gréine	Ballyclogh	CO03134
27	20902402	549195.2627	601969.4106	O'Callaghan's Funeral Chapel	Ballyclogh	CO03135
28	20902403	549309.1274	602138.0162	Ballyclogh Castle	Ballyclogh	CO03149
29	20902404	549545.1955	601943.1344	Church of Saint John the Baptist	Ballyclogh	CO03150
30	20902405	549062.8346	601183.421	Blossomfort House	Ballyclogh	CO03201

MAP ID	NIAH	ITM E	ITM N	Structure	Td.	WTG
31	20902406	549002.232	601935.6709	Ballyclogh House	Ballyclogh	CO03199
32	20902407	549265.0642	601999.452	-	Ballyclogh	CO03200
33	20902409	549737.0272	601948.2963	-	Ballyclogh	CO03202
34	20902414	552445.2954	603241.916	Copsetown Abbey	-	CO03203
35	20902411	553339.4463	605187.4166	Grange Bridge	-	CO03204
36	20902413	549451.5865	603126.6383		-	CO03206
37	20902415	546309.8282	602694.0829	Ballygiblin House	-	CO03207
38	20902416	545066.6235	602769.1563	-	-	CO03294
39	20902417	547326.6158	602233.1392	Castlelohort	-	CO03295
40	20902420	545109.7101	607066.7896	-	-	CO03304
41	20902422	545653.342	603473.5707	Ballygiblin House	-	CO03341
42	20902423	545382.3652	603506.4396	Ballygiblin House	-	CO03342
43	20902424	545620.4766	603464.6466	Ballygiblin House	-	CO03348
44	20902425	545528.2368	603592.1813	Ballygiblin House	-	CO03350
45	20902426	545634.1894	603510.7555	Ballygiblin House	-	CO03351
46	20902428	549204.6876	601956.6706	Ballyclogh Graveyard	Ballyclogh	CO03354
47	20902427	549187.485	601951.3327	Ballyclogh Graveyard	Ballyclogh	CO03355
48	20902410	552431.7917	603235.197	Copsetown Abbey	-	CO03357
96	20902412	553459.3058	604342.5767	Hunting Bridge	-	CO03205
122	20901616	149409	111260	Mount Corbitt	Mountcorbitt	-
123	20901617	149369	111233	Mount Corbitt	Mountcorbitt	-

SMRs within 100m of Grid Connection Route Option One

SMR No	Class Code	Name	Townland	Map No.	Potential Effect
CO033-112002-	ENCL	Enclosure	Ballyviniter Lower	130	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO033-134----	RABR	Railway Bridge	Ballyviniter Lower	131	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO025-177---	FUFI	Fulacht Fia	Two-Pot House	132	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO024-099----	SOUT	Souterrain	Kncokaunavaddree	133	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO024-108----	LIME	Kiln – Lime	Ballybeg Middle	134	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed -.
CO024-112002-	QARR	Quarry	Ballyviniter Lower	135	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed -.
CO024-134----	RATH	Ringfort- rath	Ballyviniter Lower	136	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed -.

SMRs within 100m of Grid Connection Route Option Two

SMR No	Class Code	Name	Townland	Map No.	Potential Effect
CO024-099----	RATH	Ringfort - rath	Knockaunavaddree	128	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO024-108----	NOAN	Redundant Record	Ballybeg Middle	129	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO033-112002-	ENCL	Enclosure	Ballyviniter Lower	130	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO033-134----	RABR	Railway Bridge	Ballyviniter Lower	131	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed
CO025-177---	FUFI	Fulacht Fia	Two-Pot House	132	No Change/Neutral effect as site is located outside of the public road where the grid connection will be constructed

NIAH Structures within 100m of Grid Connection Route Option One:

MAP ID	NIAH	ITM E	ITM N	Structure	Td.
125	20902510	155948	104670	Two-Pot House Chapel	Oldtwopoth
126	20902518	156107	103428	Castle Kevin	Castlekevin
127	20902525	156178	102406	Wood View	Curraghphade
149	20902512	155734	104459	Hazelwood House	Two-Pot-House

NIAH Structures within 100m of Grid Connection Route Option Two:

MAP ID	NIAH	ITM E	ITM N	Structure	Td.
35	20902411	153379	105132	Grange Bridge	Ballybeg
125	20902510	155948	104670	Two-Pot House Chapel	Oldtwopoth
126	20902518	156107	103428	Castle Kevin	Castlekevin
127	20902525	156178	102406	Wood View	Curraghphade

ACAs within the Turbine Delivery Route One Study Area:

MAP ID	Name
146	Askeaton Friary (in Ruins)
147	Charleville
148	Buttevant

Record of Protected Structures within the Turbine Delivery Route Option One Study Area:

MAP ID	RPS No.	Structure	Td.	RMP Ref
145	912	Abbey – Medieval Site – Franciscan Friary	Moig South	-

NIAH Structures within the Turbine Delivery Route Option One Study Area:

MAP ID	NIAH	ITM E	ITM N	Structure	Td.
35	20902411	553339	605187	Grange Bridge	Ballybeg
150	21901123	540336	652179	Hollypark House Wall	Currahchase North
151	21901216	548135	652330	M. O'Kelly house	Cloghatacka
152	21901219	548305	652324	Public House	Cloghatacka

NIAH Structures within the Turbine Delivery Route Option Two Study Area:

MAP ID	NIAH	ITM E	ITM N	Structure	Td.
166	20903320	554619	600412	Railway Bridge	Ashgrove, Lodge
167	20513166	567471	572220	Limestone Plaques	Cork City
170	20902410	552432	603235	Copsetown Abbey House	Copsetown
171	20902414	552445	603242	Copsetown Abbey Farmyard Complex	Copsetown

SMRs within the Turbine Delivery Route Option One Study Area

SMR No	Class Code	Name	Townland	Map No.	Potential Effect
CO017-053012-	TODE	Town Defences	Buttevant	153	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI013-012----	BRID	Bridge	Ballinacurra	154	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI013-168----	FUFI	Fulacht Fia	Rossbrien	155	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI013-169001-	FUFI	Fulacht Fia	Rossbrien	156	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI013-079002-	FUFI	Fulacht Fia	Dooradoyle	157	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI021-168----	MOSI	Moated Site	Attyflin	158	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI030-131----	EXMI	Excavation – Misc	Croom	159	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI030-133----	NOAN	Redundant Record	Croom	160	No Change/Neutral effect as site is located outside of the

SMR No	Class Code	Name	Townland	Map No.	Potential Effect
					public road and no proposed groundworks.
LI030-135----	RGDH	Ring-ditch	Croom	161	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI030-136----	NOAN	Redundant Record	Anhid West	162	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI030-137----	NOAN	Redundant Record	Anhid West	163	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI030-139----	NOAN	Redundant Record	Anhid West	164	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
LI013-237001-	NOAN	Redundant Record	Rossbrien	165	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
CO024-099----	RATH	Ringfort - rath	Knockaunavaddre	128	No Change/Neutral if groundworks take place outside of the buffer zone.

SMRs within the Turbine Delivery Route Option Two Study Area

SMR No	Class Code	Name	Townland	Map No.	Potential Effect
CO024-102----	QARR	Quarry	Copsetown	172	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
CO024-201----	SOUT	Souterrain	Copsetown	173	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
CO024-103----	RATH	Ringfort - rath	Copsetown	174	No Change/Neutral effect as site is located outside of the public road and no proposed groundworks.
CO024-097----	KBCR	Kerb circle	Kncokaunavaddre	175	No Change/Neutral if groundworks take place outside of the buffer zone.

Voided Map Numbers

Map Number
140
141
142
143
144
168
169

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Appendices

CHAPTER 15– ARCHAEOLOGY AND CULTURAL HERITAGE

Appendix 15.2: Impact Assessment and the Cultural Heritage Resource

APPENDIX 15.2
IMPACT ASSESSMENT AND THE CULTURAL HERITAGE RESOURCE

Potential Impacts on Archaeological and Historical Remains

Impacts are defined as 'the degree of change in an environment resulting from a development' (Environmental Protection Agency, 2022). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways:

- Permanent and temporary land-take, associated structures, landscapes mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape;
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation;
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits;
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value;
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow;
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits; and
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.

Predicted Impacts

The severity of a given level of land-take or visual intrusion varies with the type of monuments, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;

Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;

Assessment of the levels of noise, visual and hydrological impacts, either in general or site-specific terms, as may be provided by other specialists.

EIAR VOLUME III
Appendices

CHAPTER 15– ARCHAEOLOGY AND CULTURAL HERITAGE

Appendix 15.3: Mitigation measures and the Cultural Heritage Resource

APPENDIX 15.3
MITIGATION MEASURES AND THE CULTURAL HERITAGE RESOURCE

Potential Mitigation Strategies for Cultural Heritage Remains

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved *in situ.*

Definition of Mitigation Strategies

The ideal mitigation for all archaeological sites is preservation *in situ*. This is not always a practical solution, however. Therefore, a series of recommendations are offered to provide ameliorative measures where avoidance and preservation *in situ* are not possible.

Archaeological Test Trenching can be defined as 'a limited programme of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate' (CIfA, 2020).

Full Archaeological Excavation can be defined as 'a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains with a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design' (CIfA, 2020).

Archaeological Monitoring can be defined as 'a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (CIfA, 2020).

Underwater Archaeological Assessment consists of a programme of works carried out by a specialist underwater archaeologist, which can involve wade surveys, metal detection surveys and the excavation of test pits within the sea or riverbed. These assessments are able toa success and assess the potential of an underwater environment to a much higher degree than terrestrial based assessments.

EIAR VOLUME III
Appendices

CHAPTER 15– ARCHAEOLOGY AND CULTURAL HERITAGE

Appendix 15.4: Photographs

APPENDIX 15.4
PHOTOS

Photo 15.1: General view looking along access track towards substation location, looking south.

Photo 15.2: General view looking north towards T9.

Photo 15.3: General view of location of T8, looking west

Photo 15.4: General view of location of T6, looking north.

Photo 15.5: General View of Location of T7, looking north.

Photo 15.6: View of 19th century possible limekiln (138) to the northeast of T7, looking south.

Photo 15.7: General view of location of T5 and nearby geological feature, looking east.

Photo 15.8: General view looking across access track in central part of site, looking north-west to T4.

Photo 15.9: General View of location of T4, looking south-east.

Photo 15.10: General view of the location of T3, looking south.

Photo 15.11: View of approximate location of Fulachta Fiadh (61), looking east.

Photo 15.12: General view looking north towards T2 and enclosure (60) beyond.

Photo 15.13: View of approximate location of enclosure cropmark (60), looking north-east.

Photo 15.14: View of approximate location of cropmark (89) to the south-east of T1, looking east.

Photo 15.15: General view of approx. location of T1, looking north toward historic building (137).

Photo 15.16: View of historic 19th century structures (137), looking north.

Photo 15.17: Representative view from the top of Kilmaclenine Castle (9), looking west towards the Proposed Development.

Photo 15.18: Representative view from land near Blossomfort ringfort (3), looking north-east towards the Proposed Development.

Photo 15.19: Representative view from Ballygiblin House and Grounds (113), looking north-east towards the Proposed Development.

Photo 15.20: Representative view from Lohort Castle and Grounds (10), looking north towards the Proposed Development.

Photo 15: 21: Representative view from St Mary's Catholic Church (108), looking south towards the Proposed Development

Photo 15.22: Representative view from Lisgriffen Castle (7), looking south towards St Marys Catholic Church (108) and the Proposed Development.

Photo 15.23: View of Proposed Grid Connection Route Options 1 and 2 over Ballyviniter Railway Bridge (131).