Chapter 11 – Aviation & Telecommunication

Introduction

11.1 A wind development has the potential to cause a variety of effects on telecommunications, television signals, aviation and radar infrastructure by introducing new physical structures (turbines) into an area. Large structures can affect this infrastructure in predominantly two ways, these are:

i. The blocking and/or reflection of radio signals from telecommunications infrastructure, television transmitters, radar installations and other navigation aids.

ii. By presenting a collision risk for aircraft.

11.2 This section of the chapter describes the existing environment with respect to telecommunications, television and aviation (including radar), and the potential impacts to their operations as a result of construction and operation of the Development. Where required the associated impact significance is provided and the appropriate mitigation options are presented.

11.3 This chapter is based on work completed by Pager Power Limited and should be read in conjunction with ES Appendices 11.1-11.3 where the specific impact assessment relating to each discipline are presented.

Planning Policy Context, Legislation and Guidance

11.4 Technical Advice Note 8 (TAN 8) on Planning for Renewable Energy (Welsh Assembly Government, 2005), provides technical advice to supplement the policy set out in Planning Policy Wales (PPW) (Welsh Assembly Government, 2012). The PPW does not contain any specific guidance on the potential electro-magnetic interference resulting from wind turbine developments. Technical Advice Note 8 (TAN 8) recommends consultation with a number of organisations.

11.5 The relevant guidance for each discipline is provided in the following sub-sections.

Telecommunications

11.6 The telecommunications assessment has been carried out in accordance with the principles contained within the following publications:

i. International Telecommunications Union (1992), Assessment of impairment caused to television reception by a wind turbine, Recommendation ITU-R BT805.

ii. International Telecommunications Union (2010), ITU-R BT.2142-1;

iii. Bacon (2002), A proposed method for establishing an exclusion zone around a terrestrial fixed radio link outside of which a wind turbine will cause negligible degradation of the radio link performance;

iv. Joint Radio Company (2014): Calculation of Wind Turbine clearance zones for JRC UHF (460MHz) Telemetry Systems when turbine sizes and locations are accurately known – Issue 4.2.

Television

11.7 The television assessment has been carried out in accordance with the principles contained within the following publications:

i. BBC, the impact of large buildings and structures (including wind farms) on terrestrial televisions reception.

ii. International Telecommunications Union (1992), Assessment of impairment caused to television reception by a wind turbine, Recommendation ITU-R BT805.

iii. International Telecommunications Union (2015), ITU-R BT.2142-2.

Aviation

11.8 The aviation assessment has been carried out in accordance with the principles contained within the following publications:

i. Civil Aviation Authority (2016), Civil Aviation Publication 764: CAA Policy and Guidelines on Wind Turbines – Version 6;

ii. Civil Aviation Authority (2019), Civil Aviation Publication 168: Licensing of Aerodromes – Edition 11.

Assessment and Consultation

11.9 During the course of the EIA, Rhoscrowther Windfarm Limited commissioned Pager Power to produce specialist reports to investigate a three Wind Turbine layout. A Communication Link Desk Study, Television Desk Study Assessment and High-Level Aviation Assessment are contained within ES Appendix 11.1-11.3. Detailed methodologies adopted in each of the assessments are given in the appropriate appendix as listed above.

11.10 In addition to the formal scoping, additional consultation was undertaken with the relevant stakeholders[1] to inform the assessment, a summary of which is provided in Table 11.1 below.

Table 11.1 Consultation Responses

Consultee	Scoping/Other Consultation[2]	Issue Raised	Response/Action Taken
Airwave	Consulted for information to inform the assessment	A separate assessment conducted by Airwave is	This assessment can be conducted once the

[1] Consultation with the Office for Communications (Ofcom) is no longer possible due to GDPR limitations.
[2] Consultation was undertaken for a previous five wind turbine layout. The three wind turbine layout covers a similar footprint to the larger fiver wind turbine layout. Given the small increase in turbine dimensions (compared to the original five), reduction in turbine numbers, turbine positions and previous responses, the consultation remains applicable.

Consultee	Scoping/Other Consultation[2]	Issue Raised	Response/Action Taken
		required to understand in issue.	planning application is submitted.
Arqiva	Consulted for information to inform the assessment	Provided link details.	No objection.
Atkins	Consulted for information to inform the assessment	None	No objection.
BT	Consulted for information to inform the assessment	None	No objection.
Ericsson	Consulted for information to inform the assessment	None	No objection.
Joint Radio Company (JRC)	Consulted for information to inform the assessment	None	No objection.
Vodafone	Consulted for information to inform the assessment	None	No objection.
NATS	To be consulted in planning	n/a	n/a
MOD	To be consulted in planning	n/a	n/a

11.11 Further details of consultation responses received for telecommunications are provided in ES Appendix 11.1

Study Area

Telecommunications

11.12 Telecommunications infrastructure was identified through consultation with the relevant communication stakeholders. The search radius was approximately 750m from the site

centre of the Development however most stakeholders apply their own safeguarding radii based on the turbine locations.

Television

11.13 The assessment boundary for the assessment of television interference was 20km by 20km based on the site centre of the Development.

Aviation

11.14 The study area for aviation infrastructure was defined by identifying infrastructure that was within or close to their safeguarded range of the Development. Specifically, this includes the following infrastructure. Each have their own relevant safeguarding criteria:

i. UK AIP listed Civil Aerodromes and Heliports within 15km of the site centre.

ii. Unlicensed airfields within 10km of the site centre;

iii. Civil Airport ATC radars within 40km of the site centre or that are within line of sight to the wind turbines;

iv. NATS en-route radar sites within 100km of the site centre or that are within line of sight to the wind turbines.

v. En-Route radio navigation beacons within 10km of the site centre;

vi. Use of the on-line NATS self-assessment maps;

vii. Ministry of Defence ASACS radar sites with radio line of sight to the Development.

viii. Military Aerodromes within 60km of the site centre.

ix. Military ATC radar sites within 60km of the site centre or that are within line of sight to the wind turbines;

x. Military PAR radar sites within 40km of the site centre;

xi. Ministry of Defence Tactical Training Areas within 10km of the site centre;

xii. Meteorological Radars within 20km of the site centre.

xiii. Other significant aviation issues which require consideration.

Desk Based Research and Data Sources

Telecommunications

11.15 Telecommunications infrastructure were provided through consultation.

Television

11.16 The relevant television transmitter data was identified through a review of the coverage and transmitter maps.

Aviation

11.17 The relevant aviation and defence infrastructure was identified through a national database maintained by Pager Power based on information provided in aviation charts and maps, as well as previous consultation with aviation and defence stakeholders.

Significance Criteria

Telecommunications, Television and Aviation

Magnitude of Effect

11.18 Each effect is assessed based on its magnitude and the sensitivity of the affected receptor. The classifications of effect magnitude are presented in Table 11.2 below.

Table 11.2 Defining Magnitude of Effect

Magnitude of Impact	Criteria for assessing impact
High	Total loss or substantial alteration to key features of the baseline conditions such that receptor attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key features of the baseline conditions such that receptor attributes will be materially changed.
Low	A minor shift away from baseline conditions. Change arising from the alteration will be discernible but not material. The underlying attributes of the baseline condition will be largely unchanged.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

11.19 The definitions are based on best practice and project experience.

Sensitivity of Receptor

11.20 The classifications of receptor sensitivity are presented in Table 11.3 below.

Table 11.3 Defining Sensitivity of Receptor

Sensitivity	Examples of receptor
High	The receptor has little ability to absorb change without fundamentally altering its present character or is of international or national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character or is of high importance.
Low	The receptor is tolerant of change without detriment to its character or is of low or local importance.

11.21 The definitions are based on best practice and project experience.

Significance of Effect

11.22 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity. The Effect Significance Matrix is set out in Table 11.4 below.

Table 11.4 Matrix for Assessing Significance of Effect

Magnitude	**Sensitivity**		
	High	**Medium**	**Low**
High	Major adverse	Major adverse	Moderate adverse
Moderate	Major adverse	Moderate adverse	Moderate adverse
Low	Minor adverse	Minor adverse	Minor adverse
Negligible	Negligible	Negligible	Negligible

11.23 The definitions are based on best practice and project experience.

Telecommunications

11.24 The effect upon is the partial or complete loss of information transferred via radio waves which are interfered with by wind turbines, be it the static structure or rotating blade. The effect is dependent on numerous factors including the relative location of the links ends to the wind turbines, the level of visibility between link ends and wind turbines, the link's frequency and the number of wind turbines in proximity to a link path. Therefore, the resulting effect on individual point-to point links will vary.

11.25 A 'Moderate' or higher magnitude of effect to telecommunications systems would be considered significant. This is where a loss or alteration to the baseline conditions would

materially change the receptor attributes i.e. telecommunications systems were significantly affected such that there was a loss in the data being transmitted.

11.26 With regard to receptor sensitivity, any location where telecommunications systems are significantly affected beyond baseline conditions (such that a point-to-point link was rendered ineffective), a significant effect would occur. This could be for a multiple point-to-point links, where mitigation would be required for all. Therefore, any legal permanent receptor where telecommunications systems previously operated effectively are considered to be of 'Medium' sensitivity.

11.27 Overall, the Significance of Effect which would be considered 'significant' in EIA terms is 'Moderate Adverse' and mitigation would be required.

Television

11.28 The effect of television interference for a viewer of terrestrial or satellite television services is dependent on numerous factors including the height of the receiving equipment and the quality of the aerial/cables. Therefore, the resulting effect on individual receivers will vary.

11.29 A 'Moderate' or higher magnitude of effect to television services would be considered significant. This is where a loss or alteration to the baseline television reception conditions would materially change the receptor attributes i.e. television services were significantly affected such that they were unwatchable.

11.30 With regard to receptor sensitivity, any location where television interference was significantly affected beyond baseline conditions (such that a requested channel was rendered unwatchable), a significant effect would occur. This could be for a single dwelling or apartment building, where mitigation would be required for both. Therefore, any legal permanent receptor where television signals were previously received are considered to be of 'Medium' sensitivity.

11.31 Overall, the level of effect which would be considered 'significant' with respect to EIA if the resultant significance of effect was 'Moderate Adverse', however it is best practice monitor television interference through a planning condition, television written scheme and post-construction reception survey.

Aviation

11.32 The effect upon aviation and radar systems is dependent on numerous factors including the size, number and location of wind turbines relative to the aviation infrastructure. Therefore, the resulting effect on the relevant infrastructure will vary.

11.33 A 'Moderate' or higher magnitude of effect to aviation infrastructure would be considered significant. This is where a technical or operational impact would materially affect safety i.e. clutter on a radar screen caused by wind turbines meaning air traffic needs to be diverted.

11.34 With regard to receptor sensitivity, any location where aviation infrastructure and/or operations was significantly affected beyond baseline conditions, a significant effect would occur. However, aviation infrastructure varies significantly and therefore sensitivity can range from 'Low' to 'High'.

11.35 Overall, the level of effect which would be considered 'significant' with respect to EIA if the resultant significance of effect was 'Moderate Adverse'.

Assessment Limitations

Telecommunications, Television and Aviation

11.36 The assessments are limited to desk-based modelling. No site surveys have been undertaken which may provide more accurate data within the assessment modelling, specifically for telecommunications and television.

Existing Conditions

Telecommunications

11.37 At the site there are currently no wind developments that would be considered significant with respect to telecommunications safeguarding.

11.38 All relevant telecommunications stakeholders were consulted, links identified through the consultation, where a 750m radius search radius was requested, are listed in Table 11.5 below. A full list is provided in ES Appendix 11.1.

Table 11.5 Communication Links that Cross near the Site

Link	**Operator**
Greenhill-Carmel	Arqiva
Link: Greenhill-Preseli	Arqiva
VFE66347	Vodafone
460MHz Telemetry and Telecontrol: 3 1GHz Microwave Point to Point: 2	JRC – the JRC to not provide specific link details.

11.39 The links plotted in relation to the Development site footprint as illustrated in Figure 1 of ES Appendix 11.1.

Television

11.40 At the site there are currently no wind developments that would be considered significant with respect to television safeguarding.

11.41 Pager Power conducted a desk-based assessment into the effects of the project on television reception in the vicinity of the proposed Rhoscrowther Wind Farm in a 20km by 20km area surrounding the Development.

11.42 A comprehensive search of transmitter and coverage maps was undertaken to determine the relevant transmitters in the area. The results revealed that the Carmel main transmitter located approximately 68km north east, Preseli main transmitter located approximately 39km north east and the Greenhill relay transmitter located approximately 2km west of the Development may be affected by it. Only digital terrestrial television services are broadcast from each.

11.43 Within the 20km by 20km area, eighteen locations around the site were reviewed in greater detail with respect to the likely transmitter usage. The results are presented below in Table 11.5.

Table 11.6 Transmitter Information

Location	**Likely Transmitter to be used**
Rhoscrowther + five properties at Pleasant View and Pleasant View Road	Preseli or Greenhill
Newton	Preseli
Angle	Preseli
Pwllcorchan	Preseli or Greenhill
Maiden Wells	Preseli
Warren	Preseli
Castlemartin	Preseli
Milford Haven	Preseli or Greenhill
Pembroke Dock	Preseli or Greenhill

Location	Likely Transmitter to be used
Pembroke	Preseli or Greenhill
Burton/Burton Ferry	Carmel or Preseli
Wallaston Green	Preseli
Hundleton	Preseli
Kingsfold	Preseli
St Petrox	Preseli
St Twynnells	Preseli
Merrion	Preseli
Dale	Preseli

Aviation

11.44 At the site there are currently no developments that would be considered significant with respect to aviation and defence safeguarding.

11.45 The following aviation and radar infrastructure were identified by Pager Power in their assessment. The results are presented below in Table 11.6.

Table 11.6 Identified Aviation Infrastructure

Aviation Infrastructure/ Stakeholder	Comment
NATS En-Route Radar Sites	No NATS En-route Radars that lie within 100km of the site centre and no NATS beacons lie within 10km of the site centre. The closest radar is Burrington Primary Surveillance Radar (PSR) - 110km from the Development. Whilst the

	Development is in line of sight, at this distance no operational impacts would be predicted.
UK AIP listed Civil Aerodromes and Heliports	No UK AIP listed Civil Aerodromes and Heliports 15km of the site centre. The closest aerodrome is Haverfordwest – 17km from the Development.
Unlicensed Airfields	Rosemarket (unlicensed) - 7km from the Development.
Civil Airport Air Traffic Control (ATC) Radar	No significant airports known to have ATC radar lie within 40km of the site centre.
Military Radar	Aberporth Range Primary Surveillance Radar (PSR) – 60km the Development. Manorbier PSR – 17km the Development. The Development is in line to sight to this radar however an operational impact is unlikely because it is a radar associated with an anti-aircraft range and is not intended for general ATC or threat detection outside of this.
Military Low Flying	According to the MOD published Low Flying Consultation Zones, the Development is located within a “Low priority military low flying area less likely to raise concerns”.
Meteorological Radar	There are no meteorological radar installations within a radius of 20km from the site centre.

Construction Effects

Telecommunications, Television and Aviation

11.46 Installation of the Development would require two cranes and it is anticipated that each turbine would take two to three days to install (dependant on suitable weather conditions).

11.47 Cranes have the potential to block or reflect signals during the construction of the Development. The construction phase could therefore potentially result in some temporary electromagnetic interference which would present a temporary minor adverse impact to both telecommunication links and televisions. No impact would be anticipated for aviation however lighting is required if they measure 150m above ground level or above and the CAA must be notified of their presence.

11.48 Any effect of the Development during construction would be less than or, at worst, the same as the effect during operation of the Development.

Operational Effects

Telecommunications

11.49 Following the consultation, eight links were identified in the vicinity of the Development, with details provided for three of these. These were plotted relative to the Development to determine whether the wind turbines may affect the identified communication links.

11.50 The technical assessment (Communication Link Desk Study) identified that none of the exclusion zones (based on the Ofcom methodology) associated with each of the three links would be located close to the wind turbines. The analysis has found that no impact upon the communications link is expected based on the Development layout. This is shown in ES Figure 1.1, all wind turbines are outside of the associated exclusion zones therefore there will be no concerns in relation to operational impact. This is confirmed through the consultation in ES Appendix 11.1.

11.51 The remaining five links are operated by the JRC. The JRC undertook their own assessment and the proposal cleared with respect to radio link infrastructure operated by Western Power Distribution South Wales (JEWA).

11.52 In conclusion, based on the assessment of the identified infrastructure, the Development will have no impact upon communications links.

11.53 Mitigation options would be available if effects were to transpire. This is discussed in the 'mitigation' section of this chapter.

Television

11.54 The technical assessment (Television Desk Study Assessment) has found that the overall impact on television services during operation is likely to be low. It is expected that no effects will be experienced upon television services. Mitigation options would be available if effects were to transpire. This is discussed in the 'mitigation' section of this chapter.

11.55 As per Table 11.2-11.4, the Magnitude of Effect is 'Low' and the Sensitivity of Receptor is 'Low' resulting in the Development having a 'Minor Adverse' Significance of Effect, at worst, upon terrestrial television signals in the area surrounding the development.

11.56 The modelling details and findings of the assessment are provided in full in ES Appendix 11.2 (Volume I of the ES). For convenience these are summarised in Table 11.7 below.

Table 11.7 Television signal Interference Assessment

Location	**Likely Transmitter to be used**	**Interference (CIR)**	**Assessment**
Rhoscrowther + five properties at Pleasant View and Pleasant View Road	Preseli or Greenhill	<5, 5-15 and no interference	Details of five properties at Pleasant View and Pleasant View Road have been provided to Pager Power by Rhoscrowther Wind Farm Limited. These residences could encounter

			television interference. No other dwellings were identified in this area.
Newton	Preseli	5-15 and >15	Aerials observed orientated towards Preseli. Sporadic areas of moderate interference are predicted however a small number of dwellings are observed. It is possible that the modelled interference is caused by the Development.
Angle	Preseli	5-15 and >15	Interference to the Preseli transmitter is likely to be caused by terrain and not the Development at this location. Angle is in the forward scatter region relative to Greenhill transmissions ad partially for Carmel transmissions however it is likely that the aerials could be re-orientated towards Preseli if required.
Pwllcorchan	Preseli or Greenhill	<5, 5-15 and >15	Interference modelled here is not expected to be caused by the Development considering its location relative to the assessed transmitters. No significant impact is expected.
Maiden Wells	Preseli	5-15 and >15	Interference modelled here is not expected to be caused by the Development. No significant impact is expected.
Warren	Preseli	5-15 and >15	Aerial observed orientated towards Preseli. Sporadic areas of moderate interference are predicted. It is deemed unlikely that the modelled interference is caused by the Development. No significant impact is expected.
Castlemartin	Preseli	5-15 and >15	

Milford Haven	Preseli or Greenhill	<5, 5-15 and no interference	These locations are not in the shadow area of any transmitter. Interference predicted is not expected to be caused by the Development. No impact expected.
Pembroke Dock	Preseli or Greenhill	<5, 5-15 and no interference	
Pembroke	Preseli or Greenhill	<5, 5-15 and no interference	
Burton/Burton Ferry	Carmel or Preseli	<5, 5-15 and no interference	These locations are not in the shadow area of any transmitter. Interference predicted is not expected to be caused by the Development. No impact expected.
Wallaston Green	Preseli	>15	These locations are not in the shadow area of any transmitter. No impact expected.
Hundleton	Preseli	>15	
Kingsfold	Preseli	>15	
St Petrox	Preseli	>15	Interference modelled here is not expected to be caused by the Development considering its location relative to the assessed transmitters. No impact is expected.
St Twynnells	Preseli	>15	These locations are not in the shadow area of any transmitter. No impact is expected.
Merrion	Preseli	>15	
Dale	Preseli	>15	
Location	**Likely Transmitter to be used**	**Interference (CIR)**	**Assessment**

Rhoscrowther + five properties at Pleasant View and Pleasant View Road	Preseli or Greenhill	<5, 5-15 and no interference	Details of five properties at Pleasant View and Pleasant View Road have been provided to Pager Power by Rhoscrowther Wind Farm Limited. These residences could encounter television interference. No other dwellings were identified in this area.
Newton	Preseli	5-15 and >15	Aerials observed orientated towards Preseli. Sporadic areas of moderate interference are predicted however a small number of dwellings are observed. It is possible that the modelled interference is caused by the Development.
Angle	Preseli	5-15 and >15	Interference to the Preseli transmitter is likely to be caused by terrain and not the Development at this location. Angle is in the forward scatter region relative to Greenhill transmissions ad partially for Carmel transmissions however it is likely that the aerials could be re-orientated towards Preseli if required.
Pwllcorchan	Preseli or Greenhill	<5, 5-15 and >15	Interference modelled here is not expected to be caused by the Development considering its location relative to the assessed transmitters. No significant impact is expected.
Maiden Wells	Preseli	5-15 and >15	Interference modelled here is not expected to be caused by the Development. No significant impact is expected.
Warren	Preseli	5-15 and >15	Aerial observed orientated towards Preseli. Sporadic areas of moderate interference are predicted. It is
Castlemartin	Preseli	5-15 and >15	

			deemed unlikely that the modelled interference is caused by the Development. No significant impact is expected.
Milford Haven	Preseli or Greenhill	<5, 5-15 and no interference	These locations are not in the shadow area of any transmitter. Interference predicted is not expected to be caused by the Development. No impact expected.
Pembroke Dock	Preseli or Greenhill	<5, 5-15 and no interference	
Pembroke	Preseli or Greenhill	<5, 5-15 and no interference	
Burton/Burton Ferry	Carmel or Preseli	<5, 5-15 and no interference	These locations are not in the shadow area of any transmitter. Interference predicted is not expected to be caused by the Development. No impact expected.
Wallaston Green	Preseli	>15	These locations are not in the shadow area of any transmitter. No impact expected.
Hundleton	Preseli	>15	
Kingsfold	Preseli	>15	
St Petrox	Preseli	>15	Interference modelled here is not expected to be caused by the Development considering its location relative to the assessed transmitters. No impact is expected.
St Twynnells	Preseli	>15	These locations are not in the shadow area of any transmitter. No impact is expected.

Aviation

11.57 With no consultation undertaken with the CAA, MOD and NATS prior to submission of this application, the following section is based on Pager Power's High-Level Aviation Assessment of the potential aviation impacts associated with the Development. The full report is available in ES Appendix 11.3 (Volume III of the ES). The key findings of the High-Level Aviation Assessment are presented below:

i. All of the turbines are within radar line of sight to the MOD's Manorbier PSR at 17km from the radar.

ii. All of the turbines are within radar line of sight to the NATS' Burrington PSR at 110km from the radar.

iii. All of the turbines are within "Low priority military low flying area less likely to raise concerns".

iv. No effect upon Military Tactical Training Areas is predicted.

v. No effect upon any other radar or navigation aids is predicted.

vi. No effect upon civil or military aerodromes and heliports (licensed and unlicensed) is predicted.

vii. No effect upon Met Office infrastructure is predicted.

viii. No other aviation issues have been identified.

11.58 There is a line of sight between the Development and the Manorbier PSR operated by the MOD. Manorbier is a Marconi S511 Primary Surveillance Radar (PSR). It is known to be a Range radar and is located at the former RAF Manorbier aerodrome which is now Manorbier Range and is understood to be used for Live Firing and Unmanned Aircraft Operations. It is likely that the Manorbier PSR is used to ensure that no unauthorised ships

or aircraft enter the range danger area when it is operational. Although the Development is within line of sight to the Manorbier PSR, the Development is not located in the vicinity of the Manorbier Range Danger Area. There are also no known objections from MOD to other similar wind developments in the area in relation to potential impacts on Manorbier PSR. For instance, the nearby wind farm at Wear Point did not receive an objection from the MOD although within the ES it is mentioned that the turbines are also within line of sight to Manorbier PSR. Based on the above, it is considered unlikely that there will be an impact on the operation of the Manorbier PSR. Therefore, as per Table 11.2-11.4, the Magnitude of Effect is 'Low' and the Sensitivity of Receptor is considered to be 'High' (conservatively) resulting in the Development having a 'Minor Adverse' Significance of Effect, at worst, upon the Manorbier PSR.

11.59 The Development is in line of sight to the NATS Burrington PSR. At this distance NATS will have no significant safeguarding concerns. Therefore, as per Table 11.2-11.4, the Magnitude of Effect is 'Low' and the Sensitivity of Receptor is considered to be 'High' (conservatively) resulting in the Development having a 'Minor Adverse' Significance of Effect, at worst, upon the Burrington PSR.

11.60 The Development is located within a "Low priority military low flying area less likely to raise concerns". It is very unlikely that the MOD will have significant concerns. As per Table 11.2-11.4, the Magnitude of Effect is 'Low' and the Sensitivity of Receptor is considered to be 'Low' resulting in the Development having a 'Minor Adverse' Significance of Effect upon the low priority low flying area. The MOD may however request aviation lighting. This is discussed in the mitigation section.

11.61 No other aviation impact has been identified.

Decommissioning Effects

Telecommunications, Television and Aviation

11.62 The impact for the decommissioning stage is as per the construction stage.

Residual Effects.

Telecommunications, Television and Aviation

11.63 Any significant effects will be mitigated to restore baseline levels. Therefore, no residual effects are predicted for Telecommunications, Television or Aviation infrastructure.

Cumulative Effects Assessment

11.64 No potential for cumulative effects has been identified.

Proposed Mitigation

Telecommunications

11.65 If the location of the wind turbines within the Development should change such that the wind turbines infringe the exclusion zones, then mitigation would be required. Options for mitigating effects upon the communications links include adjusting the layout of the wind turbines, re-routing the communications link via an alternate mast, or replacing the affected link with a leased line or fibre optic cable.

11.66 It will be ensured, likely through a planning condition, that mitigation is in place ahead of the Development being erected to ensure no interference caused by the cranes during the construction period. The condition should allow flexibility as to the proposed mitigation to be implemented, allowing for other solutions which may be identified, but ensures that a satisfactory solution must be in place before operation of the Development.

Television

11.67 A post-construction television reception survey could be undertaken in the unlikely event interference is report. The aim would be to investigate any television interference complaints and validate that interference has been caused by the Development. Options for mitigating effects upon television reception include upgrading the receiving equipment e.g. via provision of a better aerial or an alternative option such as a satellite dish.

11.68 Mitigation measures for lost or affected television signal can be achieved for all affected residences, however it is necessary for the turbines to be operational before the actual affected residences can be conclusively identified. There is no need to install pre-emptive mitigation. Table 11.8 below provides a summary of the types of available actions associated with the mitigation.

Table 11.8 Television Signal Mitigation Measures

Action	**Basis**
Replacement of receiving aerial with a more directional or higher gain, aerial.	Per Residence
Repositioning the receiving aerial so that the received signal is stronger.	Per Residence
Directing the receiving aerial to an alternative transmitter that covers the area and retuning the television accordingly.	Per Residence
Upgrading antenna cabling and connections.	Per Residence
Installation of signal amplifiers.	Per Residence
Development of a bespoke local solution using a receiving aerial some distance from the dwelling.	Per Residence
Replacing terrestrial reception equipment with satellite, cable or internet reception equipment.	Per Residence

11.69 A proposed planning condition that could accompany the planning permission for both telecommunications and television is presented below:

i. *The development shall not be brought in to use until a Mitigation scheme (including site surveys) to mitigate impacts on television interference and telecommunications point-to-point links has been submitted to and approved in writing by the local planning authority, in liaison with relevant utilities providers.*

ii. *The scheme shall include the arrangements for the implementation of the mitigation measures. The development shall not be brought into use until the mitigation measures have been implemented in accordance with the approved Mitigation scheme.*

iii. *Reason for condition: To ensure that the utility network is not compromised by the development*

Aviation

11.70 No mitigation for the predicted impact upon the identified radar is required.

11.71 The MOD may request aviation lighting in accordance with military aviation lighting guidance.

Further Survey Requirements and Monitoring

11.72 Further surveys and monitoring may be required to investigate any reported impact upon terrestrial television services. These should be completed in line with the relevant planning condition.

Summary of Effects

11.73 A wind development has the potential to cause a variety of effects on telecommunications, television signals, aviation and radar infrastructure by introducing new physical structures

(turbines) into an area. Large structures can affect this infrastructure in predominantly two ways, these are:

i. The blocking and/or reflection of radio signals from telecommunications infrastructure, television transmitters, radar installations and other navigation aids.

ii. By presenting a collision risk for aircraft.

11.74 Following assessment of the potential impacts of the Development on telecommunications, television and aviation, the following impacts were identified:

i. No significant impacts upon JRC telecommunications links.

ii. No significant impact upon terrestrial television services.

iii. No significant impact upon aviation (radar) infrastructure.

11.75 No pre-emptive mitigation is required for terrestrial television interference. It is common practice to address any of the impacts identified through appropriate planning for both telecommunications and television.

11.76 No significant impact upon the MOD's Manorbier PSR or NATS' Burrington PSR is anticipated and no mitigation is required. Aviation lighting is likely to be requested by the MOD with respect to low flying operations.

11.77 Table 11.9 summarises the predicted effects of the Development.

Table 11.9 Summary of Effects

Predicted Effects	Significance	Proposed Mitigation	Residual Effects
Telecommunications	Minor Adverse	None currently	None
Television	Minor Adverse	None pre-emptively	None

Aviation	Minor Adverse	None anticipated for MOD or NATS radar Aviation lighting in line with MOD request.	None