19. TELECOMMUNICATIONS AND UTILITIES

19. Telecommunications and Utilities

19.1. Introduction

19.1.1. Due to the size and nature of wind turbines, they have the potential to interfere with below ground infrastructure and with electromagnetic signals passing above ground during, which can include telecommunication links, microwave links, and television reception with aviation addressed separately in Chapter 16.

19.1.2. In particular, the tower, rotating blades and generator elements of wind turbines have the most potential for interference with electromagnetic signals. The degree and nature of the interference will depend on:

- the location of the wind turbine between receiver and transmitter;
- characteristics of the rotor blades;
- characteristics of receiver;
- signal frequency; and
- the radio wave propagation in the local atmosphere.

19.1.3. This Chapter details the consultation that has been undertaken, the existing baseline for these elements as it relates to the Proposed Development and presents an assessment of the likely effects as a result of the Development. Where necessary, details of appropriate mitigation or management procedures to mitigate or avoid effects are provided.

19.2. Guidance

19.2.1. There are a number of documents which provide guidance on infrastructure considerations for wind energy developments. The guidance considered in this assessment are:

- British Wind Energy Association (BWEA), (1994) Best Practice Guidelines for Wind Energy Developments;
- OFCOM (2009) Tall Structures and Their Impact on Broadcast and Other Wireless Services;
- OFCOM (2003) Guidelines for Improving Digital Television and Radio Reception;
- The Scottish Government (2013) Onshore Wind Turbines; and
- HSG 47 Avoiding Danger from Underground Services.

19.2.2. The potential effects generated by the Proposed Development have been assessed with reference to the above documents.

19.3. Consultation

19.3.1. During the updated scoping stage in 2018, consultation was undertaken with various consultees with regard to the potential effects that could arise from the Proposed Development. Consultation was either undertaken directly with the consultees listed or via records searches for infrastructure data. A summary of the findings are detailed below in Table 19.1.

Table 19.1 Summary of Consultation

Consultee	Type and Date	Summary of Consultation Response
Arqiva	Consultation Enquiry, 07/04/2018	Arqiva have stated that the nearest SHF link site [Girvan] is located approximately 41 km to the West of the centre point of the Development. Arqiva has confirmed that they have no concerns about the Proposed Development and microwave links.
Atkins Global ('Atkins')	Consultation Enquiry, 12/04/2018	Atkins has examined the Development in relation to Ultra High Frequency (UHF) Radio Scanning Telemetry communications and has no objection to the Proposed Development.
BT	Consultation Enquiry, 20/03/2018	BT has stated that the Development would not cause interference to BT's current and presently planned radio network.
Joint Radio Company (JRC)	Scoping Response, 30/5/2018	JRC requested additional information in regards to turbine locations on 22/3/2018. The analysis of these locations indicates that the Proposed Development would not interfere with radio link infrastructure operated by Scottish Power and Scotia Gas Networks.
Spectrum Licensing	Consultation Enquiry, 11/04/2018	Spectrum Licensing identified one link identified within 2.5 km (0950837/1 Vodafone) and recommended contacting Vodafone for the exact location.
Vodafone	Consultation Enquiry, 16/04/2018	Vodafone provided coordinates for their link. Analysis of the link indicates it is to NE and E of the Proposed Development Siteand is not a constraint for turbine locations within Site.
Scottish Water	Scoping Response, 01/05/2018	Scottish Water has no objection to the Development.
Scottish Power Energy Network (SPEN)	Scoping Enquiry 21/03/2018	Scottish Power Energy Networks requested turbine co-ordinates in March 2018 and September 2018 as part of the route planning for the 132 kV Lorg and Longburn wind farm grid connection.

19.4. Assessment Methodology

19.4.1. The potential effects assessed in this Chapter have been identified through consultation. Effects during the construction and decommissioning phases are classed as temporary, short term effects. Potential effects which are associated with the operational phase of the Proposed Development are classified as long-term effects.

19.4.2. It is industry practice not to assess the short-term effects on television reception and telecommunications from wind farms during the construction and decommissioning phases. Consultation with infrastructure operators has

indicated that any effects will only occur as a result of turbine erection and operation. Consequently, this assessment does not consider effects associated with construction and decommissioning activities on these receptors.

19.4.3. Effects on these receptors are of a technical nature, and where unacceptable effects are predicted to occur, a technical solution may be sought with the owner/operator of the infrastructure to ensure the continued acceptable technical operation of the infrastructure.

19.5. Baseline and Assessment of Effects

Telecommunications

19.5.1. Consultation with the relevant organisations was initiated during the initial stages of the EIA to identify any potential microwave or telecommunication links that could be affected by the Proposed Development. Spectrum Licensing monitors the fixed microwave links throughout the UK, whereas JRC manages the radio spectrum used by the UK Fuel and Power Industry. Atkins undertakes a similar role for the water industry (although does not manage links operated by Scottish Water). Arqiva operate the BBC and ITV transmission network.

19.5.2. The search for existing telecommunication and microwave links was undertaken within a 3 km radius of the approximate centre point of the turbine envelope. This distance covers the radius of the turbine envelope increased by an additional 500 m to ensure all telecommunication and microwave links are identified.

19.5.3. Spectrum Licensing produced a fixed link report which identified one potential link within the search area, licensed to Vodafone UK. Vodafone UK was contacted and confirmed the link location. Further analysis indicates that the Proposed Development would not interfere with this telecommunication links.

19.5.4. JRC, Atkins and Arqiva identified no links within the search area and have raised no objection to the Proposed Development. As there are no links within or adjacent to the Proposed Development that would be affected, no significant effects will occur.

19.5.5. Digital television signals are not generally affected by the operation of wind turbines; however, minimum signal strength is required for digital television to operate effectively. If a property already receiving a weak digital signal experiences additional blocking or reflections from wind turbines, the signal level may drop, causing the television to pixelate or cut out intermittently. Reflections and blocking from other objects (such as trees) close to a receptor can cause similar effects. Simple measures to boost the signal through an improved receiver are usually sufficient to correct the issue.

19.5.6. The area surrounding the Proposed Development site receives television signals that were made exclusively digital, after the digital switchover was completed, and hence no analogue TV signals are broadcast in the area. As a result, it is considered that the television reception received by the houses close to the Proposed Development will not be affected, and no significant effects will occur. However, in the event that interference which is directly

attributable to the Proposed Development, is experienced, the Applicant will endeavour to implement a suitable mitigation solution. Examples of technical solutions include: changing the receptor height, re-orientating the receptor to receive signals from an alternative transmitter, upgrading the receptor system or installation of satellite television. The requirement for a corrective action would be best identified after the onsite survey is complete, and the Proposed Development is operational.

19.5.7. Broadcast radio (FM, AM and DAB digital radio) are transmitted on lower frequencies than those used by analogue TV signals. Lower frequency signals tend to pass through obstructions more easily than the higher frequency TV signals, and diffraction effects also become more significant at lower frequencies. Both of these factors will tend to lessen the impact of wind turbines on radio reception. Should interference to radio signals be experienced as a result of the Proposed Development, the technical solutions described in the above paragraph are considered as suitable mitigation measures.

19.5.8. Based on the information received during consultation and the remote nature of the Proposed Development from residential areas, no effects are predicted on telecommunications or television and radio reception as a result of the Development.

Utilities

19.5.9. Other below ground infrastructure, such as utilities, could be affected during construction; however, implementation of best practice would ensure that these are not adversely affected during construction or operation. Consultation with Scottish Water was undertaken via Dumfries and Galloway Council with Scottish Water offering no objection to the Proposed Development, presumably because they have no infrastructure that would be affected.

19.5.10. Further consultation with Scottish Power Energy Networks (SPEN) has taken place with the aim of ensuring that the layout of the wind farm and proposed route of the 132 kV Lorg and Longburn grid connection are compatible (see paragraph 2.31 of chapter two).

19.5.11. Prior to construction, a line search for undergrounded utilities would occur and any services located. Adverse effects would be avoided through the implementation of safe systems of work. During construction, there may be construction traffic passing beneath electricity lines along the transportation route. Although it is very unlikely that any damage to this infrastructure will occur, appropriate management measures will be put in place to ensure that electricity lines are not affected by the Proposed Development, and that the Proposed Development is constructed in accordance with relevant health and safety legislation as appropriate. Following the implementation of such measures, if necessary, there will be no effect on utility infrastructure as a result of the Development, and it is not considered further.

19.6. Summary of Effects

19.6.1. Consultation undertaken with the telecommunications consultees highlighted that the Proposed Development will not interfere with telecommunications and electromagnetic signals. One link was identified within 3 km of the Site, but as it is located over 100 m away from the nearest turbine, there will be no resulting effects. Therefore, there are no significant effects predicted upon telecommunications as a result of the Proposed Development.