16 TELECOMMUNICATIONS AND UTILITIES

16.1 Introduction

16.1.1 Wind turbines, due to their size and nature, have the potential to interfere with below ground infrastructure as well as electromagnetic signals passing above ground. Below ground infrastructure can include water pipes, drainage and sewerage pipes, gas mains, and, buried electrical cables. Constructing the wind and solar farm has potential to directly impact existing utilities below ground, if the presence of these is not clearly understood in advance. Above ground signals can include telecommunication links, microwave links, and television reception. Aviation is addressed separately in Chapter 17.

16.1.2 The towers, 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.

16.1.3 The four primary objectives of this chapter are to:

- Establish a baseline of the existing telecommunication assets and infrastructure at the Site;
- Summarise the consultation with telecommunications and utilities operators, detailing their responses and any objections received.
- Assess the likely EMI effects from the Proposed Development on existing utilities and telecommunication assets and infrastructure; and
- Present appropriate mitigation measures or management solutions to mitigate any detrimental EMI effects.

16.1.4 This chapter of the EIA Report has been prepared by Wardell Armstrong and presents the assessment that has been carried out into the potential of the Proposed Development to cause electromagnetic interference (EMI) on television, radio and

microwave fixed links within in the site vicinity. The assessment also summarises the desk-based assessment to identify overground and underground utilities in close proximity to the Proposed Development.

16.1.5 Adverse or significant impacts can be avoided or mitigated by siting the turbines outside of any safeguarding buffer zones, re-routing the electromagnetic links or modifying the transmission equipment.

16.1.6 To manage the risks of an EMI event occurring and disrupting telecommunications, a consultation has been undertaken with relevant stakeholders that are currently operating fixed links in the vicinity of the Site. This chapter builds on the findings of the consultation process that assessed the impact of the Proposed Development on communication systems (i.e., fixed links).

16.1.7 To assess underground utilities, a 'linesearch' was undertaken to identify cables, pipelines and other services crossing the Site or lying within close proximity. Consultation was undertaken with the respective utility transmission and distribution operators for the area, to ensure the Proposed Development would not interfere with utilities assets. Consultees included (but were not limited to) the gas transmission operator, National Gas Transmission (NGT); electricity distribution and transmission operator National Grid Electricity Distribution (NGED); and gas distribution operator Wales & West Utilities.

16.2 Guidance

16.2.1 There is no overarching guidance to inform the assessment of EMI effects. But 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[1];
- Ofcom (2009) Tall Structures and Their Impact on Broadcast and Other Wireless Services[2];
- Ofcom (2003) Guidelines for Improving Digital Television and Radio Reception[3];

[1] British Wind Energy Association, 1994. Best practice guidelines for wind energy development. British Wind Energy Association.
[2] Ofcom, 2009. Tall Structures and Their Impact on Broadcast and Other Wireless Services. Accessed: https://www.ofcom.org.uk/__data/assets/pdf_file/0026/63494/tall_structures.pdf
[3] Ofcom, 2009. Guidelines for Improving Digital Television and Radio Reception.

- Ofcom (2022) Fixed-link Wind Turbine Exclusion Zone Method[4];
- Health and Safety Executive (2001) HSG 47 Avoiding Danger from Underground Services[5]; and
- Welsh Assembly Government (2005) Technical Advice Note 8 on Planning for Renewable Energy[6].

16.2.2 The Office for Communications (Ofcom) is an independent regulatory body whose primary duties are set out in the Communications Act of 2003. It is the regulator for the UK communications industries and is responsible for dealing with any complaints of interference to communication mediums including television, radio and telecommunications. The duties of the former regulator, the Radiocommunications Agency, were absorbed by Ofcom at its formation.

16.2.3 Ofcom ensure the optimal use of the electromagnetic spectrum. In addition to this, under the Wireless Telegraphy Act of 2006, Ofcom is responsible for protection of the spectrum from interference or abuse, be it either deliberately or unintentionally caused.

16.2.4 Under the Act, Ofcom have no direct powers to remedy any interference that takes place. Instead it aims to ensure identification and mitigation of issues via the planning system, prior to construction, in order to avoid any future conflicts.

16.2.5 As a result of this, Ofcom provides a fixed link clearance service to help ensure compatibility between proposed wind turbines and existing fixed point to point links that make use of the Ofcom-assigned spectrum.

16.3 Assessment Methodology

16.3.1 The potential effects assessed in this Chapter have been identified through consultation with telecommunication operators in the area. 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.

[4] Bacon, D.F., 2002. Fixed-link wind-turbine exclusion zone method. OFCOM, October.
[5] HSE (Health and Safety Executive), 2001. HSG47: Avoiding Danger from Underground Services. Accessed: https://www.hse.gov.uk/pubns/priced/hsg47.pdf
[6] Welsh Assembly Government (2005). Technical Advice Note 8 on Planning for Renewable Energy. Accessed: https://www.lexisnexis.co.uk/legal/guidance/technical-advice-note-8-planning-for-renewable-energy-in-wales

16.3.2 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 following turbine erection and while operational. Consequently, this assessment does not consider effects on receptors during the construction and decommissioning phase.

16.3.3 Where unacceptable effects to receptors are predicted to occur, a solution may be sought with the owner/operator of the infrastructure to ensure continued operation.

16.3.4 The primary study area was constituted of land within a 500m radius of the Site. This radius establishes a sufficient buffer to identify all telecommunications links that could be affected by the Proposed Development. Ofcom's spectrum information portal was initially consulted to obtain information on the active fixed links within the study area.

16.3.5 In the event that planning is granted, the final choice of turbine make and model will be subject to a competitive tender process. The application therefore considers an envelope within which the chosen turbine will fit, with a tip height not exceeding 150m. However, for the purposes of this assessment a candidate turbine has been used to inform modelling. Consequently, all three wind turbines are assumed to be Enercon E-138 turbines with a fixed hub height of 81m, rotor diameter of 138m and tip height of 150m as part of the application.

16.3.6 Once a shortlist of network operators active in the area was determined, consultation requests were submitted to the specific network operators and to a few other nation-wide operators who are consulted as a matter of course, in case they have assets in the area.

16.3.7 Specific information was provided to the network operators regarding the geographical co-ordinates of the proposed locations, the candidate model, rotor diameter, hub height, and tip height for each of the 3 turbines. A micro-siting allowance of 70m was also specified for each turbine, allowing some scope for turbine repositioning depending on the ground conditions experienced onsite during the construction of the foundations.

16.3.8 Using this information, the operators were asked to either provide confirmation that there would be no adverse effects on the operation of their apparatus in the area or interference to communication links passing through the area, or else to advise if they expected there to be any negative effects.

16.3.9 The results of the consultation responses have informed this assessment in relation to EMI.

16.3.10 A preliminary assessment of utilities has been undertaken, based on a desk-based linesearch, to help identify any overhead or buried utilities in the vicinity, including amongst others, National Gas Transmission (NGT), National Grid Electricity Distribution (NGED) and Wales & West Utilities assets within the Site.

16.3.11 Whilst the desk-based line-search will identify most of the utilities in the vicinity, it is recommended that a comprehensive and updated study be undertaken prior to construction for completeness. Notwithstanding this, due to the rural setting there are not expected to any additional utilities operating nearby.

16.4 Baseline Conditions

Telecommunications

16.4.1 The information obtained from the Ofcom spectrum information portal is shown in Figure 16.1, below. Whilst there are active fixed links that have been identified in the area, none of these passes directly through the Site boundary or over potential wind turbine positions.

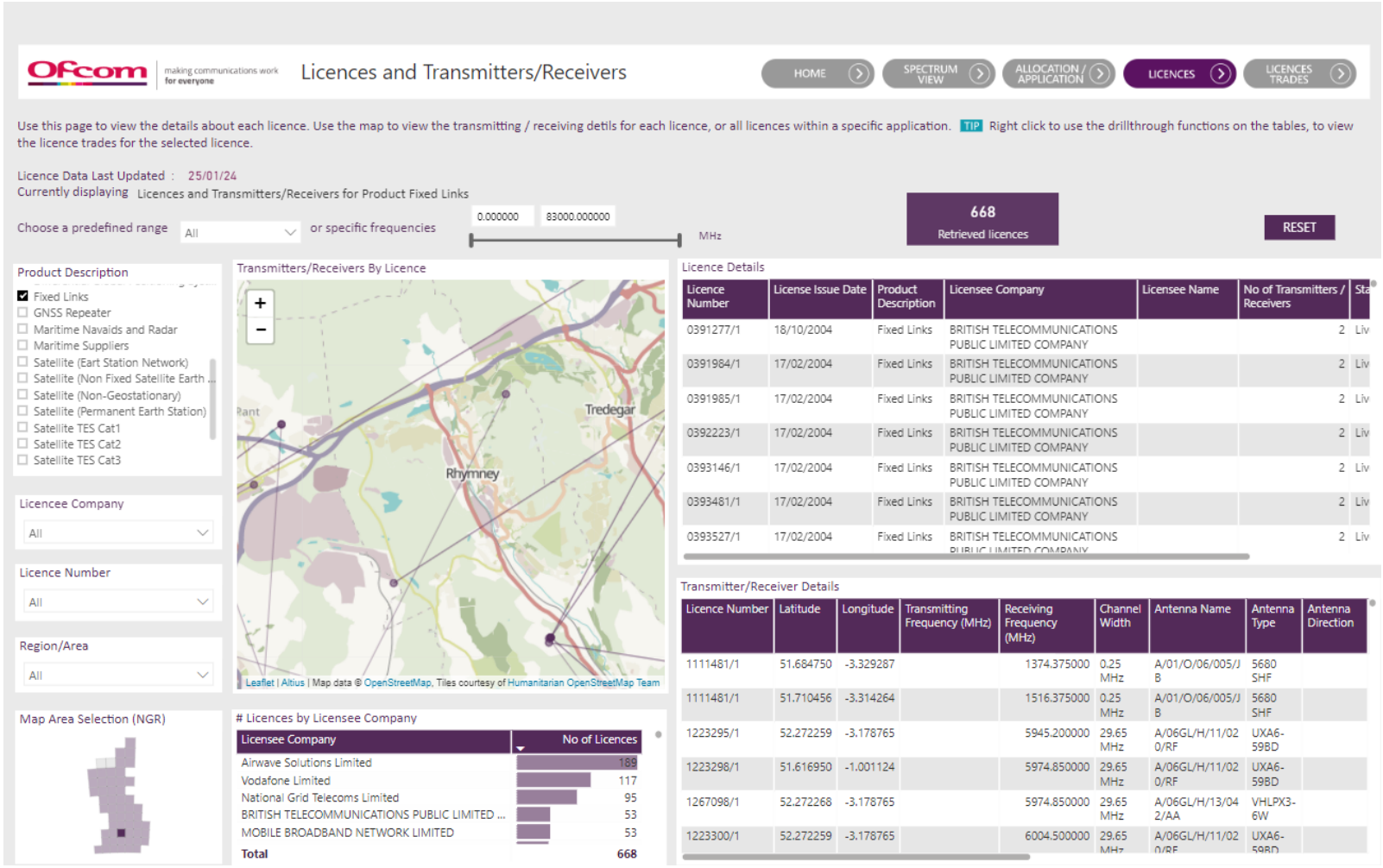

Figure 16.1: Ofcom Fixed Links Assessment[7]

[7] Ofcom 2024. Spectrum Information Portal. https://www.ofcom.org.uk/spectrum/information/spectrum-information-system-sis/spectrum-information-portal

Operators

16.4.2 Airwave Solutions was acquired by Motorola Solutions in 2016 and operate a mobile communications networks used by the emergency services.

16.4.3 Arqiva is responsible for providing the BBC, ITV and the majority of the UK's radio transmission network and is responsible for ensuring the integrity of re-broadcast links. These radio transmission networks normally operate with a 100m buffer either side of a radio link, free from interference by tall development.

16.4.4 Openreach, a subsidiary of BT, runs the UK's digital network, including phone, broadband and Ethernet services. Part of the infrastructure maintained and operated by Openreach includes a system of fixed telecommunication links across the country.

16.4.5 The Joint Radio Company (JRC) analyses proposals for wind farms on behalf of the UK Fuel & Power Industry. This is to assess their potential to interfere with radio systems operated by utility companies in support of their regulatory requirements.

16.4.6 Telefonica is a telephone operator and mobile network provider who represent Virgin Media and O2 networks.

16.4.7 Mobile Broadband Network Limited (MBNL) manage EE and 3UK mobile microwave networks within the UK. MNBL state that the distance between a link and the turbine blade tip must exceed 100m and the distance between a link end and a turbine blade tip to be greater than 250m.

16.4.8 Vodafone Group operate their own mobile phone network across the UK.

Utilities

16.4.9 An initial pass of LineSearch analysis was performed to identify the presence of underground infrastructure within the proposed development area. Utilities including those managed by NGED, NGT and Wales & West Utilities were considered within the linesearch exercise. The positions of utilities assets relative to the Site are shown in Drawing BR10167-066.

16.4.10 National Grid Electricity Distribution (NGED)'s input revealed a 33kV overhead electricity line that runs through the western part of the Site, while an underground 11kV cable runs from the A469, to the north of the site and stretches along the eastern site boundary feeding the Convatec plant with further LV cables running within the Convatec site itself.

16.4.11 Linesearch analysis revealed that for Wales & West Utilities, there are two areas of highlighted gas pipework within the Site vicinity: the industrial estate low pressure pipework which runs along the eastern site boundary and high-pressure infrastructure west of the Site.

16.4.12 Linesearch analysis was conducted for National Gas Transmission (NGT) but identified no affected assets in the area.

16.5 Assessment of Effects

Telecommunications

16.5.1 To establish which links were present within the study area and the potential effects, consultation was undertaken with the various network operators in December 2023. Network operators were invited to identify whether they expected any operational impacts to arise on assets they manage during operation of the Proposed Development.

16.5.2 The network operators were initially provided with the information for the 3-turbine scoping layout, shown in **Error! Reference source not found.**.

Table 16.1: Turbine Information Provided for Initial Stakeholder Consultation

Turbine	Easting	Northing	Model	Tip Height
T1	310265	208115	Enercorn E-138	≤150m
T2	309990	208323	Enercorn E-138	≤150m
T3	309576	208320	Enercorn E-138	≤150m

16.5.3 If the network operator established a technical case indicating there will be an adverse operational impact, a valid objection would be made. This objection would be considered 'significant' for EIA purposes and would require mitigation.

16.5.4 Following the initial consultation, a further round of consultation was initiated on 22nd January 2024 to confirm that the slight adjustment of position for turbine T1 would not create any additional conflicts. The revised turbine locations used in the second consultation are as shown in Table 16.2.

Table 16.2: Turbine Information Provided for Initial Stakeholder Consultation

Turbine	Easting	Northing	Model	Tip Height
T1	309636	208207	Enercorn E-138	≤150m
T2	310022	208255	Enercorn E-138	≤150m
T3	310274	208064	Enercorn E-138	≤150m

16.5.5 Following the consultation, responses were collected and collated from the various network operators.

16.5.6 Table 16.3 summarises the consultation responses that have been received from the relevant license holders with copies of the responses contained in Appendix 16.1. No objections were received from any consultees, although no responses were at all were received from Airwaves (Motorola Solutions) and AtkinsRéalis, despite several chases.

Table 16.3: Summary of EMI Stakeholder Consultation Responses

Consultee	Date	Details	Response
Airwaves – Motorola Solutions	N/A	Emailed with information of 19/12/2024 and 22/01/2024 but no response received.	No response
Arqiva	26/01/2024	"We have considered whether this revised layout is likely to have an adverse effect on our operations and have concluded that we have no objection."	No objection
AtkinsRéalis	N/A	Emailed with information on 19/12/2024 and 22/01/2024 but no response received.	No response
BT	24/01/2024	"The conclusion is that the location as provided, should not cause interference to BT's current and presently planned radio network. BT requires 100m minimum clearance from any structure to the radio link path."	No objection
EE/3 (Ericsson) – MBNL	19/12/2023 & 30/01/2024	On 19/12/2023: "I can confirm that there are no infringement issues with the EE/3UK mobile microwave network from the proposed turbine cluster at the coordinates you have provided." On 30/01/2024: "There is no change to the clearance approval, our nearest sites/links are >2.5km away."	No objection
JRC	23/01/2024	"This proposal is cleared with respect to radio link infrastructure operated by the local energy networks. In the case of this proposed wind energy development, JRC does not foresee any potential problems based on known interference scenarios and the data you have provided."	No objection
Telefonica (Virgin Media and O2)	26/01/2024	"I can confirm there are no issues we can see with your updated proposals."	No objection
Vodafone Group	31/01/2024	"I have plotted the below wind turbine locations and can confirm we have no Links that will be impacted "	No objection

16.5.7 The effects on networks that have confirmed they do not intend to offer an objection to the proposals are considered to be **Not Significant**.

16.5.8 The two network operators, Airwaves (Motorola Solutions) and AtkinsRéalis, who have not responded to date, will need to confirm whether any of their assets will be affected by the Proposed Development. At this stage, in the absence of any indication that they do operate assets in the vicinity of the proposed turbines and the absence of their own feedback, it is assumed that the are no impacts likely and therefore effects are **Not Significant**.

16.5.9 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.

16.5.10 Since 'the digital switchover', analogue TV broadcast signals have ceased, and the associated infrastructure has been retired. The area surrounding the Proposed Development therefore only receives digital television signals. 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.

16.5.11 Broadcast radio (FM, AM and DAB digital radio) is transmitted on lower frequencies than 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 factors tend to lessen the impact of wind turbines on radio reception.

16.5.12 Effects on television and radio assets are considered to be **Not Significant**.

Utilities

16.5.13 Below ground utility infrastructure could be affected during construction; however, implementation of best practice procedures would ensure that any utilities present will be properly identified and not adversely affected during construction or operation or eventual decommissioning.

16.5.14 Based on the initial study area (rather than details of the Proposed Development itself) NGED's advice was that its asset protection team should carry out further assessment prior to works proceeding, as a precaution because of a high degree of risk with works in close proximity to the High Voltage (HV) apparatus.

16.5.15 At its closest point, Wales and West Utilities' high-pressure gas pipeline is about 360m from the closest turbine (T1), so even accounting for any micro-siting allowance, there is no risk to this infrastructure. No other development activity associated with the Proposed Development is expected to encroach towards it either. Effects on this pipeline are considered to be **Not Significant**.

16.5.16 There are two options for connecting the private wire connection to the Convatec plant. One of these involves following the access track out to the site entrance and then following the road verge south towards the Convatec plant entering the curtilage of the plant at its northern boundary. The second option is to cross third-party land to the west of the turbine and cross the road and then enter the plant from its western boundary. This second option would potentially lead to the private wire connection needing to cross the area containing the low-pressure gas pipeline. Such activity would have the potential to cause conflict if it is not properly addressed and planned. Without mitigation the risk would be major adverse **Significant**.

16.5.17 Analysis indicated the Proposed Development would have no impact on any NGT assets. Effects on these utilities are considered to be **Not Significant**.

16.5.18 It is noted that the linesearch study that has been undertaken is not fully comprehensive in terms of covering every utility provider that could be operating in the vicinity and new infrastructure could be deployed prior to the turbines and panels being deployed. It is therefore suggested that a revised study is undertaken prior to construction commencing.

16.6 Mitigation Measures

Telecommunications

16.6.1 No electromagnetic interference is predicted on any telecommunication links in the study area so no mitigation is considered necessary.

16.6.2 In the event that an issue had been identified, the main tool for mitigating effects would be the micro-siting of turbines to avoid impinging on the Fresnel zones around the compromised radio link. If this failed, consideration would be given to the potential for relocating the transmitter or receiver, although this would obviously

need to be through dialogue with the relevant network operator. These mitigation options are mentioned here as they would continue to be the main options for mitigation should an unidentified network link be identified during any further consultation works. However, as things stand, no additional links are expected to be present, and no additional mitigation is expected to be required.

16.6.3 As part of the iterative design process, as more constraints to the project were identified through the iterative EIA process, stakeholder engagement and design optimisation, the turbine layout has been updated to better reflect the current understanding of site conditions and development limitations.

16.6.4 In the unlikely event that any TV or radio interference, 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 Proposed Development is operational.

Utilities

16.6.5 A buffer distance of at least 150m will be maintained between all turbines and any overhead power lines so there is a sufficient 'topple' distance, which will prevent major damage in the highly unlikely worst-case scenario of a turbine falling over. In the event of any micro-siting, this topple height standoff would be maintained as a minimum. As discussed above, the area is a high-risk zone in relation to NGED's apparatus and further assessment should be undertaken by asset protection as a preliminary action.

16.6.6 Prior to construction, an updated and comprehensive search for underground utilities will be undertaken to ensure that any recently installed services are properly located. Adverse effects will be avoided through the implementation of safe systems of work.

16.6.7 During construction, there may be construction traffic passing beneath electricity lines along the transportation route. Although it is very unlikely that any damage to 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.

16.6.8 Following the implementation of such measures, there will be no effect on utility infrastructure from the Proposed Development and it is not considered further.

16.6.9 In the event that the private wire connection needs to cross the area that contains the low-pressure gas pipeline, safe working practices will need to be observed at all times. Owners of the gas infrastructure (Wales and West Utilities) will need to be consulted and updated of any proposed works. Appropriate separation distance will need to be maintained between the pipework and the cable run. Provided the relevant health and safety guidelines are adhered to then the risk of adverse impact will be negligible, and the effects will be **Not Significant.**

16.7 Residual Effects

Telecommunications

16.7.1 Following the implementation of the embedded mitigation and both rounds of consultation, no significant residual effects have been identified. AtkinsRéalis and Airwaves (Motorola Solutions) have not provided any consultation response to suggest they have any concerns with the proposed scheme. On that basis no residual effects are predicted as a result of the Proposed Development.

Utilities

16.7.2 LineSearch analysis was performed to identify potential impacts on utility company assets. These included but were not limited to assets controlled by NGED, NGT and Wales & West Utilities. This revealed the presence of utilities assets for Wales & West Utilities and NGED within the Site boundary. The presence of NGED assets requires further consultation with its asset protection team but provided this is undertaken, and the other mitigation measures are enacted, there are not considered to be any impacts and no residual effects on utilities arising from the Proposed Development.

16.8 Summary

16.8.1 Following detailed assessment of the Proposed Development, and nearby utilities infrastructure and fixed links, it has been established that there will not be any significant adverse effects arising from the Proposed Development.