MWP

Appendix 14B – Telecommunications Impact Study

Ballynisky Wind Farm

Ballynisky Green Energy Ltd.

December 2025

Report

Ballynisky Wind Farm

Telecommunications Impact Study

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Executive Summary

Ai Bridges was commissioned to evaluate the possible impacts that the proposed wind farm development at Ballynisky (formerly known as Ballyegny wind farm), Co. Limerick could have on existing telecommunications operator networks. The scope of work included field and desktop surveys to determine telecommunications network infrastructure that could be impacted by the proposed development. Consultations with telecom operators were also undertaken to assist in identifying network infrastructure that could be impacted by the proposed wind farm.

Four telecommunications mast-sites were identified as sites with network infrastructure that could potentially be impacted by the wind farm development and a field survey of each of these mast-sites was carried out. During the field surveys, radio antennas with bearings in the direction of the wind farm were recorded. The findings of the field surveys are provided in Appendix B of this report.

During the consultation process, seventeen telecom operators were contacted. At the time of writing this report, fourteen of these operators have responded to the consultation request. The responses received from each of the telecom operators can be found in Section 3 of this report.

Using the information obtained during the field survey assessments and consultation process a desktop impact analysis was carried out and all of the telecommunication operator networks were analysed using radio planning \ modelling software. Results from the impact analysis indicate that there is one radio link that crosses over the proposed wind farm development. The radio link that crosses over the wind farm site boundary is listed below in Table 1.

Operator	Link Description	Impact of wind farm
Vodafone Ireland	PTP radio link from Ballymurragh East to Askeaton.	No residual impact following the implementation of an agreed mitigation measure plan , post consent

Table 1. Radio links crossing the wind farm site boundary.

Radio link analysis was carried out to determine a viable mitigation measure to offset the impact on the delivery of service to the Vodafone Basestation site at Askeaton. A mitigation measure of re-routing the service into Askeaton from an alternative Vodafone Feeder/POP site was put forward to Vodafone, who agreed to the proposal. Part of the agreed proposal was that the developer would cover the mitigation cost should the development go ahead.

Sections

Appendix

Section 1 - Site Information

1. Introduction

In this section a brief summary of the wind farm site is provided. Details regarding the site's geographic location and the proposed wind turbine dimensions are presented.

1.1 Site Information

The proposed wind farm development is located approximately 6km west of Rathkeale, Co Limerick. Details regarding the proposed wind turbines are provided below in Table 2.

Wind Farm	Number of Turbines	Turbine Hub Height	Turbine Rotor Diameter
Ballynisky	6	90 m	136 m

Table 2. Ballynisky Wind Farm Turbine Details

The location of the wind farm study area is shown below in Figure 1.

Figure 1. Location of wind farm study area.

Section 2 - Competency of Assessor

2. Competency of Assessor

Ai Bridges is a leading supplier of telecommunications solutions and software services for the telecommunications industry in the Irish marketplace. We provide comprehensive turnkey solutions and have extensive experience and knowledge of network design, implementation and deployment of telecommunications software modelling and design solutions. We have designed and commissioned telecommunications projects for clients throughout Ireland and abroad and have worked successfully with leading vendors to bring telecommunications software solutions to market for the renewable energy sector.

Ai Bridges has been supplying telecommunications solutions to wind farm industry throughout the Republic of Ireland, Northern Ireland and the UK since 2007. Aviation, telecommunications and Electromagnetic Interference impact study reports have been undertaken on behalf of wind farm operators on the potential impact on telecommunications networks and transmission networks of proposed wind farm developments. Ai Bridges has also developed a 3D software prediction model that can predict the wind farm development interference impacts on television transmission and aviation networks.

This chapter for the proposed development was prepared by the Engineering Department excess of 145 man years of experience in aviation, telecommunications\electromagnetic interference EIAR Studies. Ai Bridges Ltd extensive experience in the wind farm industry and have previously worked with many utility companies under Framework Agreements for Telecommunications Signal Interference Surveying and Remediation Services.

Section 3 - Methodology

3. Introduction

In this section a brief summary of the Telecommunication Impact Study Methodology is provided.

3.1 Methodology

There are four primary stages in preparing and compiling a communication impact study:

- Telecom Operator Consultations
- Field Surveys
- Desktop Survey Network Modelling and Analysis
- Report Generation

A summary of each of these stages is provided below:

3.1.1 Telecom Operator Consultations

Consultations are commenced with telecom operators who are requested to raise any concerns they have regarding the impact of the proposed wind farm on their networks. The consultation process is used to assist in identifying telecoms infrastructure that could be impacted by the proposed wind farm development.

3.1.2 Field Surveys

Field surveys are undertaken and the co-ordinates of communication masts are recorded. During the field surveys of the communication sites, approximations of antenna size, bearing and height are made for the antennas installed on each of the masts surveyed.

3.1.3 Desktop Survey and Analysis

A desktop survey is carried out to plot the wind turbines in a radio planning tool. The radio planning tool uses GIS and terrain mapping databases to enable accurate modelling. A selection of mast-site coordinates is then obtained and inputs from various operators \ service providers are converted from Irish National Grid (Easting and Northing in meters) to degrees minutes seconds format and then imported into the radio planning tool. This provides a means of graphically showing telecommunications sites in the vicinity relative to the proposed wind farm. Figure 2 below shows the site boundary of the proposed wind farm plotted in the radio planning tool.

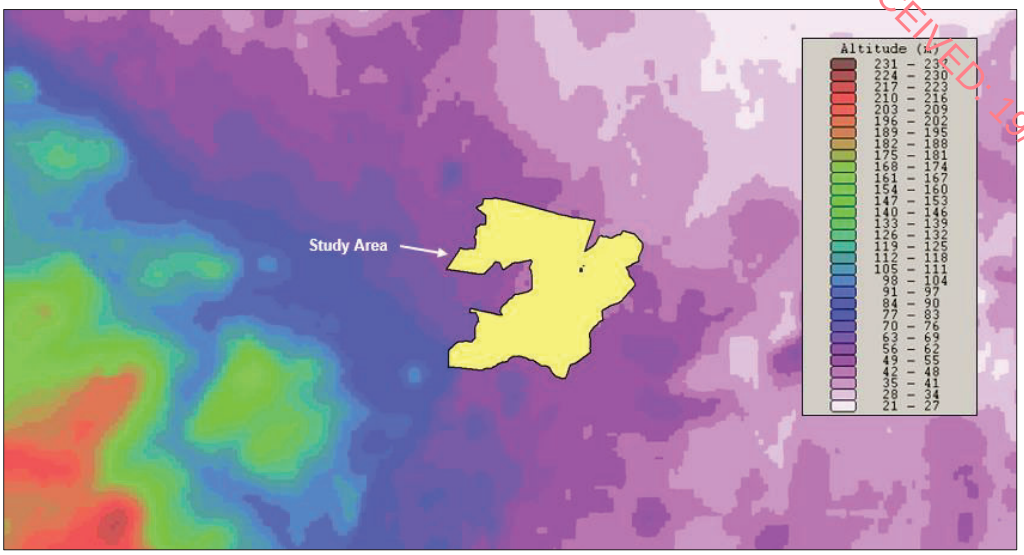


Figure 2. Wind Farm Site Boundary plotted in Radio Planning Software

The findings from the consultations and field surveys are collated and the communications networks requiring further analysis are identified. Network modeling is used to assess the impact of the turbines on the communications networks. The results from the network modeling are used to determine if mitigation measures are required. Figure 3 below shows an example of a microwave radio link that crosses over the study area modelled in radio planning software.

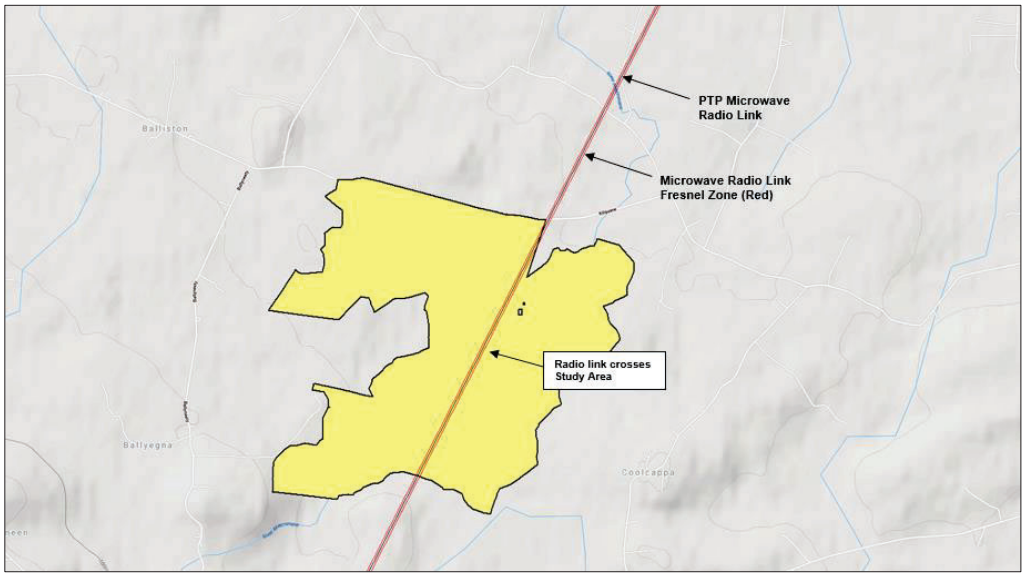


Figure 3. Example of microwave radio link crossing over/near the wind farm site boundary modelled in radio planning software.

3.1.4 Report Generation

The final stage of the communications impact study process is to collate the data and present the findings & analysis into a report for submission.

Section 4 - Telecom Operator Consultations

4. Introduction

In this section the consultation process undertaken with telecom operators is described. The response received from each operator is also provided.

4.1 Telecom Operator Consultations

Consultations beginning in February 2022 were undertaken with telecom network operators to assist in identifying telecommunication infrastructure that could be impacted by the proposed wind farm. The operators were requested to raise any concerns they may have regarding impacts to their networks due to the proposed wind farm development. Table 3 lists the telecom operators contacted and the issues raised by the operators. The responses received from each of the Telecom Operators are provided in Sections 3.1.1 to 3.1.17.

ID	Operator	Response Received (Yes/No)	Issues raised by Operator \ Observations.
1	Enet	Yes	No issues.
2	An Garda Síochána	No	No response. (No response expected.)
3	Broadcast Authority of Ireland (BAI)	Yes	No issues
4	BT Ireland	Yes	No issues
5	Eir	Yes	No issues
6	ESB Networks	Yes	No issues.
7	Irish Aviation Authority (IAA)	Yes	No issues regarding transmission links; however, the IAA have requested that Shannon Airport are notified of the proposed development to ensure appropriate screening from an aviation safety perspective.
8	Imagine Broadband	Yes	No issues.
9	Ivertec	Yes	No issues.
10	Limerick County Council	Yes	No issues
11	Viatel	No	No response. (No response expected.)
12	2RN	Yes	No issues.
13	Tetra Ireland (TI)	Yes	No issues.
14	Three Ireland	Yes	No issues.
15	Virgin Media	Yes	No issues.
16	Vodafone Ireland	Yes	No residual issues following the implementation of an agreed mitigation measure plan , post consent
17	Dept. of Defence	No	No response. (DoD is a statutory consultee and have previously stated that they will only respond to the Planning Authority under an RFI at Planning Application Stage.)

Table 3. Telecom Operators Consulted

4.1.1 Enet Response

Enet provided the following email response to consultations:

> *"This won't affect our current network."*

4.1.2 An Garda Síochána Response

To date no response has been received.

4.1.3 Broadcast Authority of Ireland (BAI)

The BAI provided the following email response to consultations:

> *"The BAI does not perform an in-depth analysis of the effect of wind turbines on FM networks. However, we are not aware of any issues from existing windfarms into existing FM networks. Also, the proposed windfarms are not located close to any existing or planned FM transmission sites."*

4.1.4 BT Ireland Response

BT provided the following email response to consultations:

> *"We only have a network presence in Louth and Waterford."*

4.1.5 Eir Response

Eir provided the following email response to consultations:

> *"We have no transmission services within the search area that will be affected."*

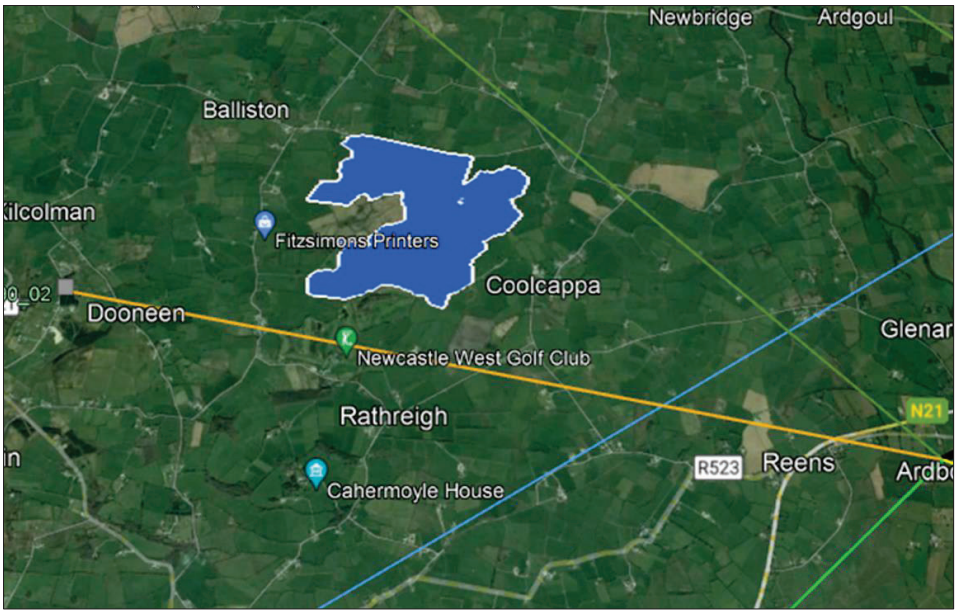


Figure 4. Graphic provided by Eir

4.1.6 ESB Networks Response

The correspondences between ESB Networks and Ai Bridges Ltd in relation to the proposed wind farm development are shown below:

26/03/21 – ESB Response

(Note: Initial response received from previous consultations conducted in March 2021):

"Hi David,

This will have no impact to our Point to Multipoint link but however a Critical Trunk Microwave radio link passes close to the development, Moneypoint to Ballingarry. Can you please send me the co-ordinates in Irish National Grid Reference or in Decimal Degrees and I will check all the turbines for potential impact?

Sites A – Moneypoint GS / 52.607797 -9.4233513 / 120m / 7624MHz
Site B: Ballingarry / 52.472789 -8.8262084 / 38m / 7470 MHz

Regards,
Myles"

04/02/22 – Ai Bridges Ltd Response to ESB Networks

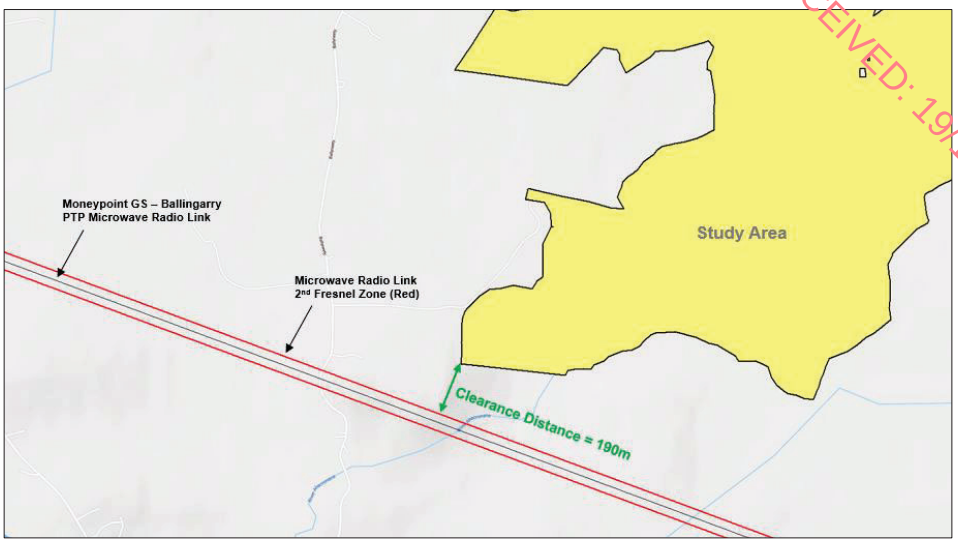
Hello Myles,

We are following up from the email we sent you earlier this week in relation to the proposed wind farm at Ballyegny [*Ballynisky*], Co Limerick. We are aware from a previous round of consultations (March 2021) that ESB Networks have a 7GHz PTP microwave radio link from Moneypoint GS to Ballingarry.

> *Hi David,*
>
> *This will have no impact to our Point to Multipoint link but however a Critical Trunk Microwave radio link passes close to the development, Moneypoint to Ballingarry.*
> *Can you please send me the co-ordinates in Irish National Grid Reference or in Decimal Degrees and I will check all the turbines for potential impact?*
>
> *Sites A – Moneypoint GS / 52.607797 -9.4233513 / 120m / 7624MHz*
> *Site B: Ballingarry / 52.472789 -8.8262084 / 38m / 7470 MHz*

Our analysis of this radio link shows that there will be a Clearance of 190m from the 2nd Fresnel Zone of the radio link to the proposed wind farm site boundary.

We have determined that there will no impacts to the operation of this link due to the proposed wind farm development and we will be advising the wind farm developer of same.



04/02/22 – ESB Networks Response

"Hi David,

Thank you for your mail. I have not carried out an impact analysis for this development yet, I had planned to have completed it this morning along with the other requests you have recently submitted however I am having issues with the radio planning application and am currently trying to resolve it.

I will revert with a response as soon as I have completed the reports, until then, do not assume we expect no impact, I will have to check that there are no additional services potentially impacted and also I may require our third party consultants to review the below development if I am concerned about any of the microwave or point to point radio links.

Can you confirm if the turbine blade tips may be placed within the outlined area have potential to microsite out of the proposed area or is this a strict maximum boundary?

Regards,
Myles"

04/02/22 – Ai Bridges Ltd Response to ESB Networks

Hello Myles,

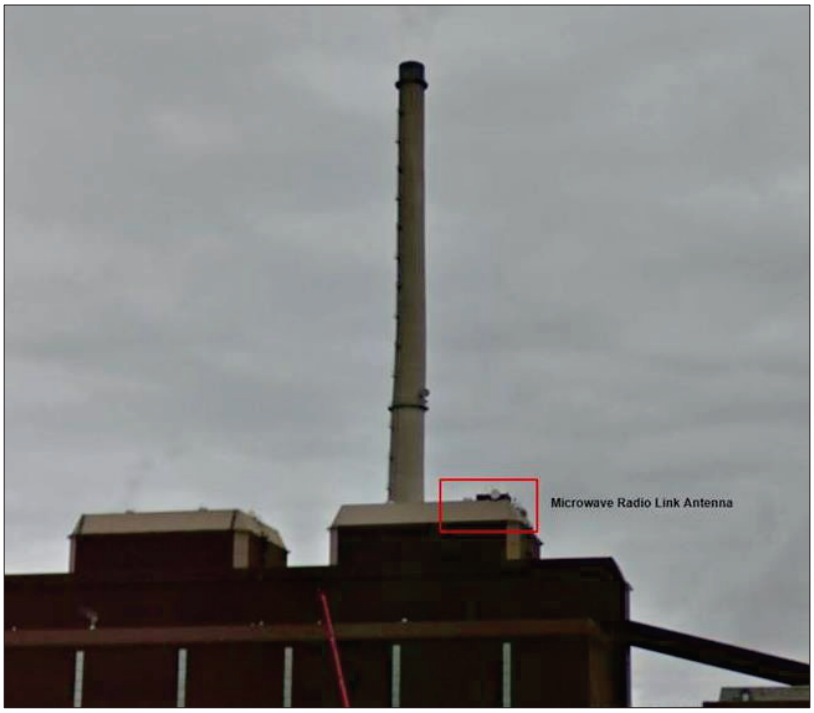
We are just following up in relation to your email below and also in relation the actual co-ordinates of the Moneypoint end of the radio link. The co-ordinates that you have provided do not match the co-ordinates of the building location (i.e. boiler house building)

Can you confirm that the antenna dish location is as per shown in the photo below as we require this for an accurate detailed analysis.

Our analysis has used the co-ordinates that you have provided and this analysis is showing that there is 190m clearance from the 2nd Fresnel of the existing radio link to the site boundary. As no turbines, or part of, can be located outside this boundary thus the clearance of 190m is valid baseline analysis.

Should you confirm that the location of the antenna \ dish is on the boiler house buildings then our analysis is showing that there will be more clearance. However our analysis based on this Boiler House location would show that there is a possible interference impact condition due to terrain

For our analysis we are only obliged to consider existing telecommunications infrastructure that is licensed.



Best Regards,
David McGrath.
Ai Bridges Ltd

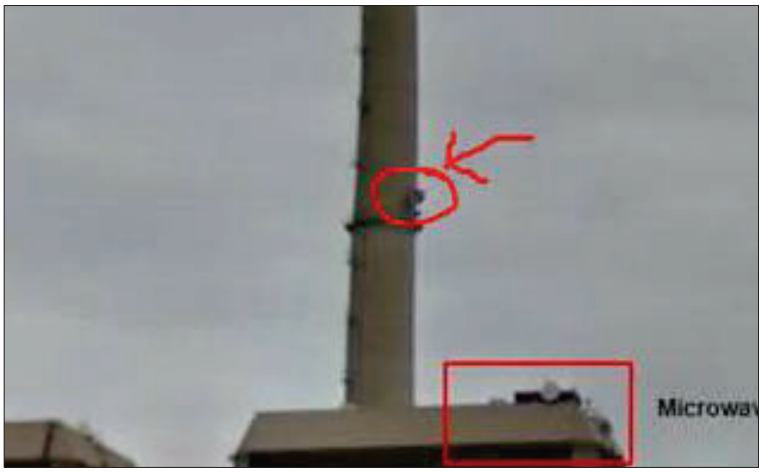
11/02/22 – ESB Networks Response

"Hi David,

To Confirm the location of the antennas, the antenna is located on the boiler house roof however it is then pointed towards a passive reflector on the chimney as indicated below.
The co-ordinates of the Moneypoint end is 52.60782584618149, -9.42335896696304 at 120m.
The co-ordinates of Ballingarry is 52.47277178954978, -8.826338676807634 at 10m.

Could you please confirm your clearance of the windfarm development as the assumption that it was installed on the corner of the building would deem the link closer to the windfarm boundary.

Is the boundary a strict outer limit of the turbine blade tips or is it the centre of the hub and also could the turbines be microsited beyond the outlined boundary?



Regards,
Myles"

14/02/22 – Ai Bridges Ltd Response to ESB Networks

Hello Myles,

Just to confirm that we have used the co-ordinates for the chimney stack that you have originally provided, in our analysis.

Also just to confirm that no turbine blade tip will extend beyond the site boundary that we have provided in the site layout shapefile. There will be no micro-siting that would allow a turbine blade tip outside the site boundary

Thank you for your prompt response
Best Regards,

Kevin Hayes,
Ai Bridges Ltd.,

4.1.7 IAA Response

The IAA provided the following email response to consultations:

Reference: **Consultation for a Proposed Wind Energy Development near Kilcolman, Co Limerick.**
Applicant: **Ballynisky Green Energy Ltd.**

Description: The proposed development of a wind farm containing six (6) wind turbines, a substation and a grid connection in the townlands of Ballynisky, Ballyegny More, Lissatotan and Graigoor to the east of Kilcolman, Co. Limerick.

Dear Ms. Heffernan,

Thank you for your letter/scoping report and request for comments in relation to the proposed wind farm containing six (6) wind turbines (max tip height of 158m), substation and a grid connection in the townlands of Ballynisky, Ballyegny More, Lissatotan and Graigoor to the east of Kilcolman, Co. Limerick.

The development appears to be approximately 18km South West of Shannon Airport, as such, it is recommended that the developer engage directly with Shannon airport (including IAA-ANSP and Engineering) to make them aware of the proposal and ensure appropriate screening from an aviation safety perspective.

It is likely that the following general observations would be proffered by the Authority during a formal planning process: In the event of planning consent being granted, the applicant should be conditioned to contact the Irish Aviation Authority to: (1) agree an aeronautical obstacle warning light scheme for the wind farm development, (2) provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and (3) notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.

Yours sincerely

P.P. G.O'Leary

Deirdre Forrest
Corporate Affairs

4.1.8 Imagine Broadband Response

Imagine Broadband provided the following email response to consultations:

"Imagine has no MW links affected by this development."

4.1.9 Ivertec Response

Ivertec provided the following email response to consultations:

"I wish to confirm that this windfarm development will not impact any links within our network. Thank you for getting in touch."

4.1.10 Limerick County Council Response

A consultation request was sent to the Limerick County Council IT Department in relation to any telecommunications radio networks operated within the county. Limerick County Council provided the following email response to consultations:

> *"Is the below e-mail in relation to a particular planning application.*
>
> *Please be advised that you can view previous applications and documentation on our website at https://www.limerick.ie/council/services/planning-and-property/apply-or-search-for-a-planning-application"*

4.1.11 Viatel Response

To date no response has been received.

4.1.12 2RN Response

2RN provided the following email response to consultations:

> *"The proposed wind farm will have no impact of 2rn's fixed linking. There is however a risk of interference to broadcast services in the area and we would ask that a protocol be signed between 2rn and the Developer should the site go ahead."*

4.1.13 Tetra Ireland (TI) Response

Tetra Ireland provided the following email response to consultations:

> *"We anticipate no impact from the development in the area proposed, can you ensure the proposal is also reviewed by eir.*

4.1.14 Three Ireland Response

Three Ireland provided the following email response to consultations:

> *"I have reviewed the site for the proposed Ballyegny [Ballynisky] Windfarm and 3Ireland have no microwave transmission links that traverse the area or that could potentially be affected."*

4.1.15 Virgin Media Response

Virgin Media provided the following email response to consultations:

> *"Virgin Media have NO radio links in this area"*

4.1.16 Vodafone Ireland Response

The correspondences between Ai Bridges Ltd and Vodafone Ireland are provided below:

> **<u>01/02/22 Vodafone Response to Consultations:</u>**
>
> *"Just the one Vodafone link passing directly through the middle of the proposed development. Details below.*

Link Name / ID	Band MHz\GHz	Link Length	Site A					Site B				
			Lat	Long	Easting	Northing	Ant Height	Lat	Long	Easting	Northing	Ant Height
LK016LK036_S0	13 GHz	22.94Km	52.41268776	9.13215387	123011	129573	30	52.59612099	8.97818694	133764	149832	30

26/09/22 Ai Bridges Ltd email to Vodafone:

Robert,

We have completed a detailed Telecommunications Impact Assessment for the proposed Wind Farm development at Ballyegny [*Ballynisky*], Co Limerick as requested by the wind farm developer.
The results of our radio link analysis indicate that the radio link from Ballymurragh East serving the Vodafone basestation at the Farmyard south of Askeaton will potentially be impacted by turbines at the proposed development.

Link: LK016LK036_S0 (Ballymurragh East to Askeaton Farm Yard)

Link Name / ID	Band MHz\GHz	Link Length	Site A					Site B				
			Lat	Long	Easting	Northing	Ant Height	Lat	Long	Easting	Northing	Ant Height
LK016LK036_S0	13 GHz	22.94Km	52.41268776	9.13215387	123011	129573	30	52.59612099	8.97818694	133764	149832	30

Vodafone – Impacted Link (Farmyard in Askeaton)

As the proposed development is designated with Strategic Infrastructure Development (SID) status, the developer has requested us to propose a suitable mitigation measure to offset the potential impact on your microwave radio link.

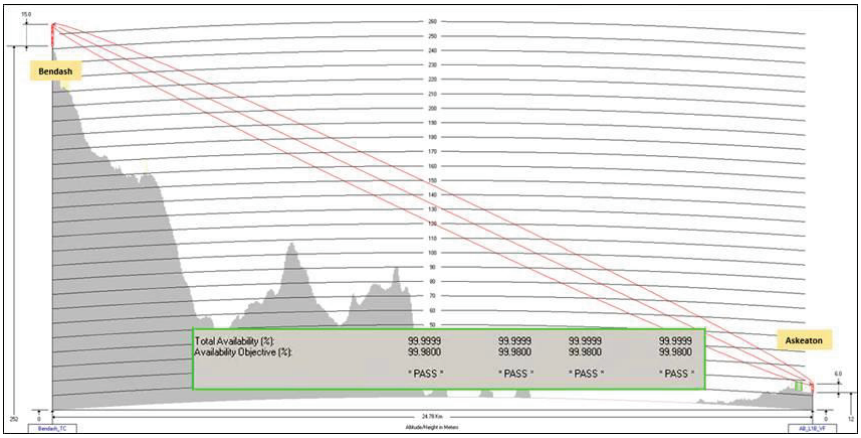
To mitigate for the impacted link we would recommend to re-route the Vodafone service into Askeaton via an alternative Feeder/POP site.

As an example of a possible alternative route into Askeaton, we have assessed the possibility of a radio link from the Telecoms Mast-site at Bendash, Co Clare.
(We are aware that other Telecom Operators have radio links into Askeaton from Bendash.)

In our analysis, we have conducted due-diligence surveys and also completed Path Profiles and Radio Link Budgets to ensure that a radio link from Bendash would pass the 99.99% availability criteria required by ComReg for licensed radio links.
The Radio Link Path Profiles and Radio Link Budgets are based on the following ITU-R Recommendations…

- ITU-R P.525-2
- ITU-R P.526-11
- ITU-R P.676-8

Bandash to Askeaton Path Profile



We would be grateful if you could let us know if re-routing the service into Askeaton via Bendash (or an alternative Feeder/POP site) is an option for Vodafone.
Note: Based on previous projects we anticipate replacement link costs (hardware and installation) of circa €10K. Bearing in mind that should the wind farm application be granted it may be 3 – 4 years before construction works would commence.

For your reference, this mitigation measure has been previously accepted and adopted by Licensed Telecom and Mobile Operators on previous wind farm developments.
We are also recommending that all mitigation measure costs would be borne by the developer, should the Planning Application for the wind farm be successful.

Yours sincerely,

_____

Kevin Hayes
For and on behalf of **Ai Bridges Limited**

30/09/22 Ai Bridges Ltd email to Vodafone:

Hello Sean, Robert,

I am just following up to see if you have had an opportunity to review the email below.

Best Regards,
Kevin Hayes.

30/09/22 Vodafone Response to Ai Bridges Ltd:

"Hi Kevin,

Apologies for not replying sooner. Yes, we have reviewed the email below.
We will need to do a line of sight survey at Askeaton and to review possible re-route options.
This will take several weeks at the earliest."

05/10/22 Ai Bridges Ltd email to Vodafone:

Hello Sean,

I am following up from our call yesterday in relation to the proposed Ballyegny Wind Farm Development (now re-named to Ballynisky Wind Farm)

As discussed I would be grateful if you could confirm that Vodafone are in agreement in principle to the proposed mitigation measure of an alternative relay link path, consisting of two relay links if required , on the basis that the wind farm developer would cover the hardware and professional services costs . Our estimated costs per link would be €12,000 based on agreements with other mobile telecoms operators. We have also been engaging with other mobile operators on recent projects and we have managed to agree this alternative option for mitigation for their impacted links.

This would allow the wind farm developer, as part of the planning application process, to complete the specific chapter in the Environmental Impact Assessment Report relating to Telecommunications for Wind Farm with the observation of a mutually accepted and agreed mitigation measure with Vodafone is in place.

Should the planning application be successful then the Planning Authority would make it a condition of planning that the agreed Mitigation Measure would be implemented to the satisfaction of Vodafone. Also noting that in the event of a successful planning application construction of the wind farm would may take 3 – 4 years from the date of application submission.

Just to confirm that

1. The wind farm developer would cover the mitigation measure costs.
2. Any he link re-routes would take place in advance of the construction and operation of the wind farm.

Thank you for your co-operation on this and I would be grateful if you could confirm acceptance of the above mitigation measure proposal at your earliest possible convenience as the planning application is being submitted in the coming week

If you require any further information or have any queries I am available this week to discuss with you.

06/10/22 Vodafone Response to Ai Bridges Ltd:

"Hi Kevin,

It would be acceptable to Vodafone for the mitigation measures to be conditions of the planning application, and be in place before construction takes place.

If/when it becomes prevalent, we can send on the costing for our desired plan, and take it from there.

Thanks,

Seán Lyons
Transmission Program Manager
Converged Transmission"

4.1.17 Department of Defence Response

To date no response has been received.

Section 5 - Field Surveys

5. Introduction

To assess the accuracy of the network information (radio link co-ordinates, antenna heights etc.) provided by the telecom operators, field surveys of the relevant telecom-mast sites in the vicinity of the proposed wind farm were carried out.

During the field surveys, radio antennas with bearings in the direction of the wind farm were recorded. The telecom mast-sites surveyed (labelled Mast-Site A, Mast-Site B, Mast-Site C and Mast-Site D) are shown relative to the proposed wind farm site in Figure 5 below. The findings from the field surveys of the mast-sites are presented in Appendix B of this report.

Figure 5. Telecom Mast-Sites Surveyed.

Section 6 - Desktop Survey Analysis

6. Introduction

Based on the findings of the consultation process, there are two Telecom Operators with networks in the vicinity of the proposed wind farm that require a detailed technical analysis:

- ESB Network
- Vodafone Ireland Network

Sections 5.1 and 5.2 below outlines the desktop survey analysis findings* for each of the Telecom Operator networks listed above.

6.1 ESB Network Analysis

The ESB Network in the vicinity of the study area consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed below in Table 4 and a Plan View of the ESB radio network is shown in Figure 6.

ID	Operator	Description
1	ESB Networks	PTP microwave radio link from Moneypoint to Ballingarry

Table 4. ESB Radio Links requiring Analysis

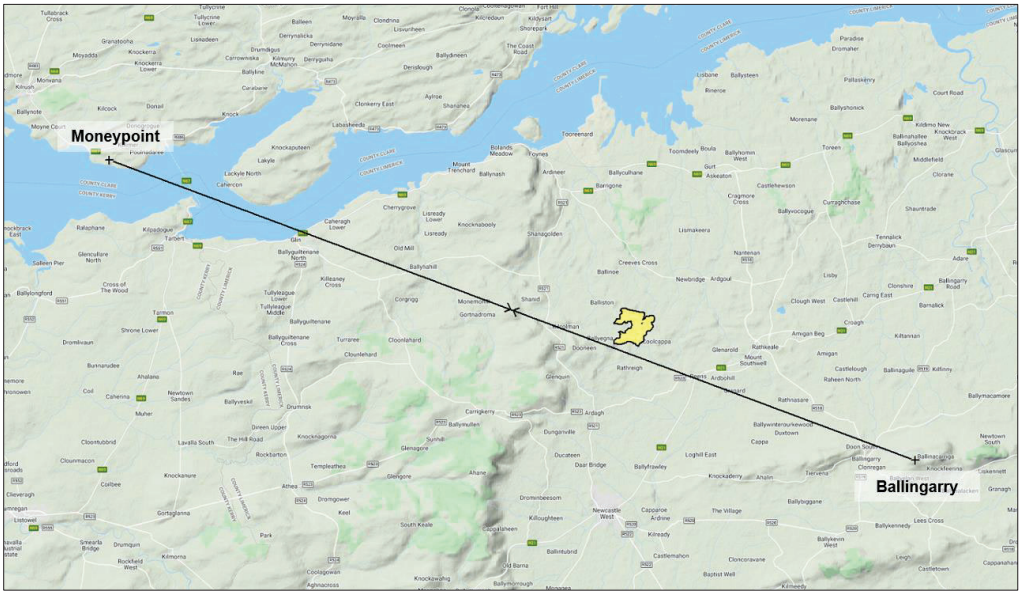


Figure 6. Plan View of the ESB Radio Network

A desktop analysis for the ESB Link has been carried out, the results of which are provided below in Section 5.1.1.

** The Desktop Survey Analysis findings are subject to accuracy of the information (GPS co-ordinates, turbine dimensions, etc.) provided to Ai Bridges.*

6.1.1 ESB Link 1 Analysis (Moneypoint – Ballingarry)

Figure 7 below shows a close-up view of the ESB PTP radio link relative to the study area. Desktop survey analysis indicates that the radio link does not cross over the study area boundary.

The clearance distance between the site boundary and the Fresnel Zone of the radio link is 190m. At this distance there will be no impact to the operation of the radio link due to the proposed wind farm.

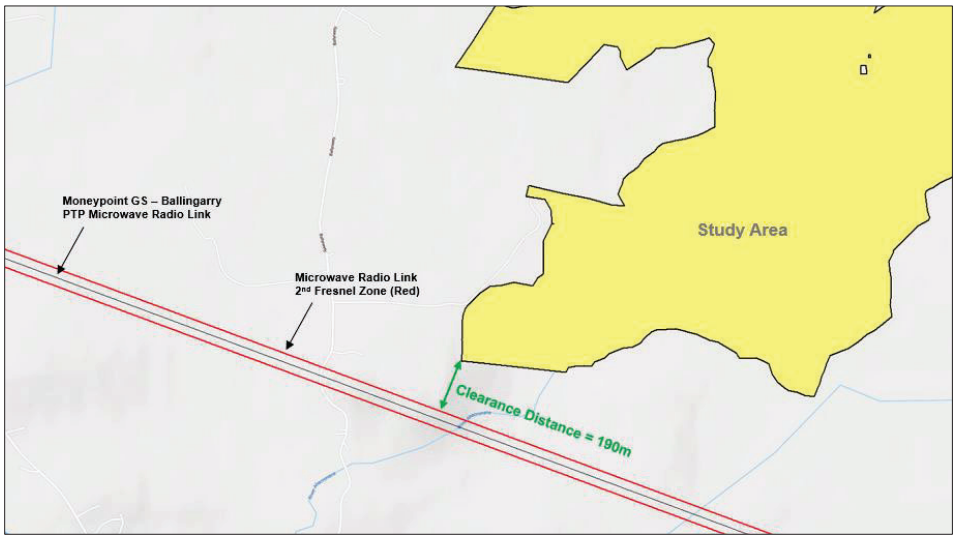


Figure 7. ESB Link 1 (Moneypoint to Ballingarry) – Close-up Plan View.

Table 5 below provides a brief summary of the Network Analysis for ESB Link 1.

Operator	ESB
Link Description	PTP microwave radio link between Moneypoint and Ballingarry.
Wind Farm Impacts	No impacts. Clearance Distance =190m

Table 5. ESB Link 1 (Moneypoint to Ballingarry) – Analysis Summary

6.2 Vodafone Ireland Network Analysis

The Vodafone Ireland network in the vicinity of the study area consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed in Table 6 below and a Plan view of the Vodafone Ireland network is shown in Figure 8.

Link ID	Operator	Link Description
1	Vodafone	PTP microwave radio link from Ballymurragh East to Askeaton

Table 6. Vodafone Ireland Radio Links requiring Analysis

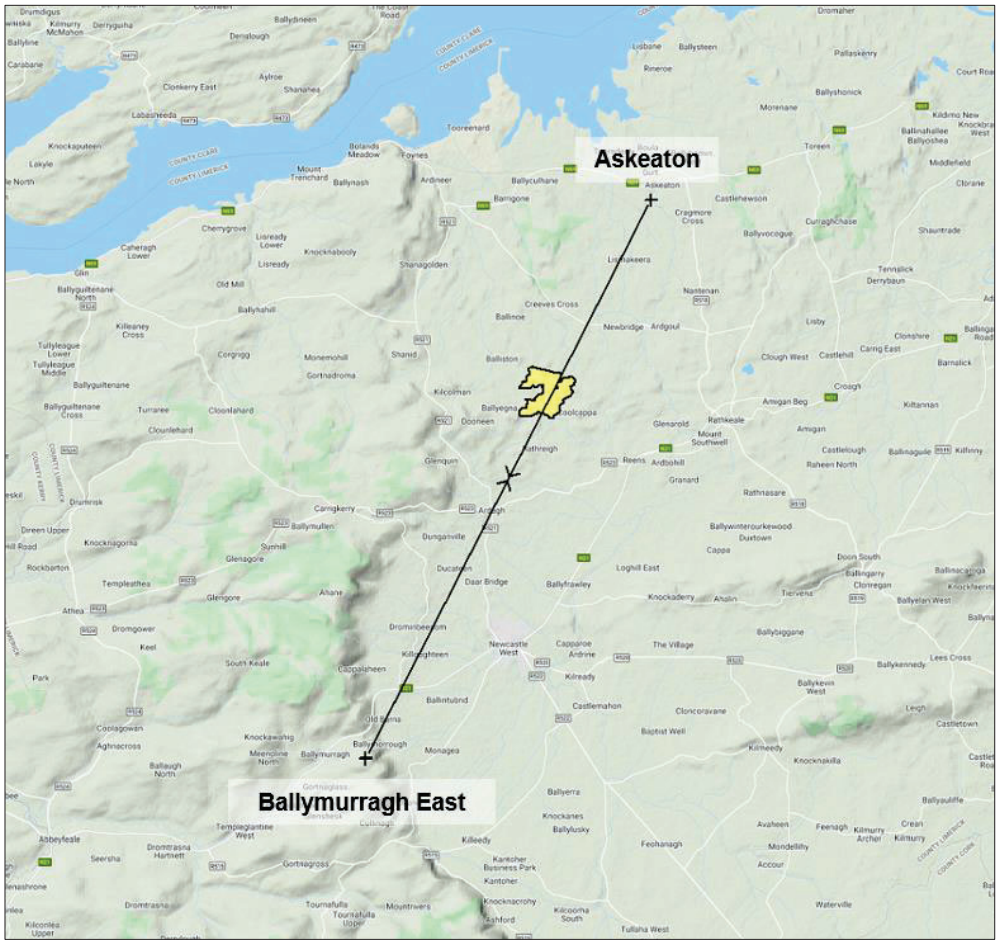


Figure 8. Vodafone Ireland Radio Network – Plan View

A desktop analysis for the Vodafone Ireland Link has been carried out, the results of which are provided below in Section 5.2.1.

6.2.1 Vodafone Ireland Link 1 Analysis (Ballymurragh East - Askeaton)

Figure 9 below shows a close-up view of the Vodafone Ireland microwave radio link relative to the study area. Desktop survey analysis indicates that the PTP radio link crosses the study area and the proposed development may impact the operation of the radio link.

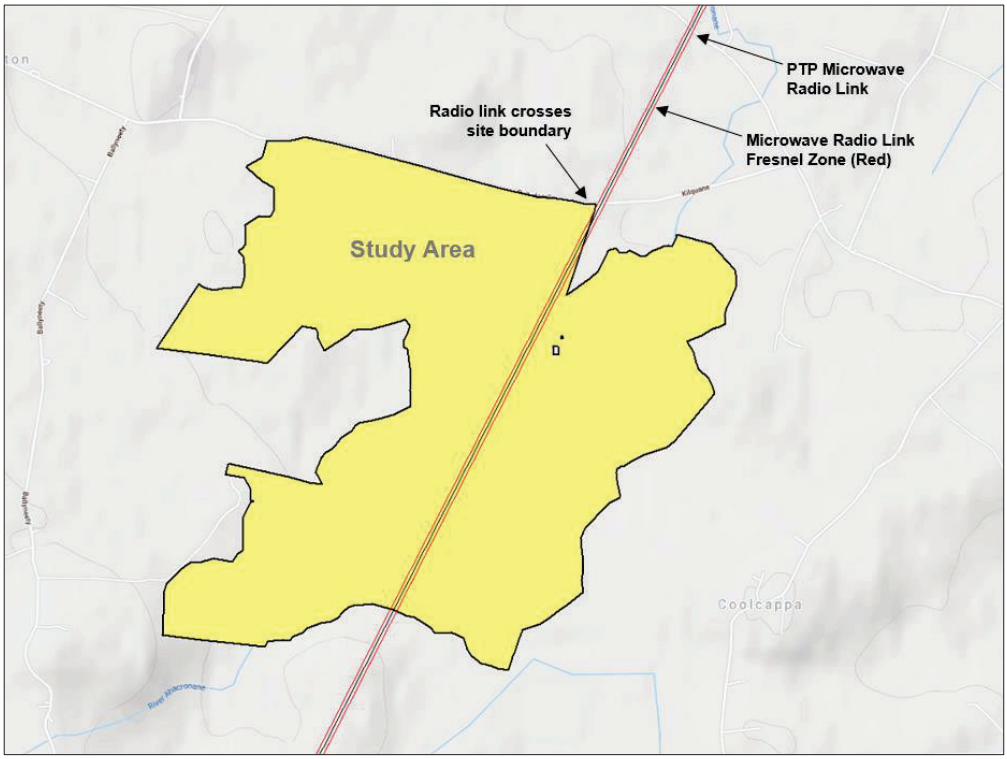


Figure 9. Vodafone Ireland Link 1 (Ballymurragh East to Askeaton) – Close-up Plan View.

Table 7 below provides a brief summary of the Network Analysis for Vodafone Ireland Link 1.

Operator	Vodafone Ireland
Link Description	PTP microwave radio link between Ballymurragh East and Askeaton.
Wind Farm Impacts	Vodafone have accepted that the mitigation measures would be conditions of the planning application, and be in place before construction takes place and that the Developer would cover the costs of the Vodafone preferred mitigationplan

Table 7. Vodafone Ireland Link 1 (Ballymurragh East to Askeaton) – Analysis Summary

Section 7 - Conclusions

7. Conclusions

From the findings made in this report the following conclusions have been made:

- Results from the telecom operator consultations and desktop survey analysis indicate that there are two radio links that cross over the proposed wind farm site boundary.

- The radio link(s) that cross over the study area are listed below in Table 8.

Operator	Licensed PTP Link Description	Impact of Wind Farm
Vodafone Ireland	PTP radio link from Ballymurragh East to Askeaton.	No residual impacts following the implementation of an agreed mitigation measure plan, post consent

Table 8. Radio Links crossing over the Study Area.

- Figure 10 below has been provided to illustrate the Vodafone Telecommunications link that crosses over the study area. This radio link could possibly be impacted by the wind farm development (dependent on wind turbine network layout and turbine dimensions).

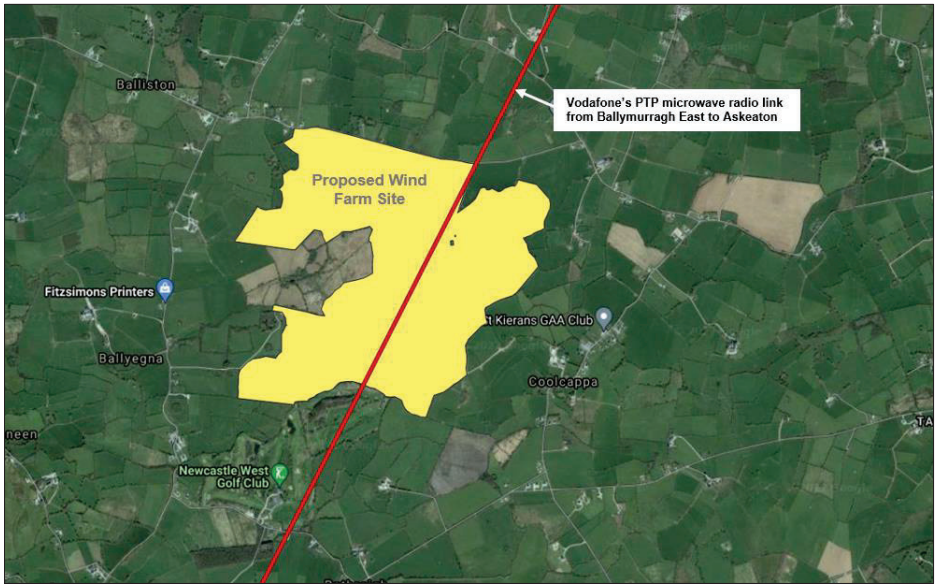


Figure 10. Vodafone Ireland Telecommunications link crossing over the Study Area

- Extensive field survey and software modelling analysis was carried out to determine viable mitigation measures of offset the impact on the delivery of service to the Vodafone Basestation site at Askeaton.

- A mitigation measure of re-routing the service into Askeaton from an alternative Vodafone Feeder/POP site was put forward to Vodafone, who agreed to the proposal. Part of the agreed proposal was that the developer would cover the mitigation cost.

APPENDIX A – Proposed Wind Turbine Co-ordinates

Appendix A – Proposed Wind Turbine Co-ordinates

The proposed wind turbine co-ordinates used in this EMI assessment are provided in the Table below.

Turbine ID	Co-ordinates (ITM)	
	Eastings (m)	Northings (m)
T1	529898.6	643084.3
T2	529841.1	642684.6
T3	529655.4	642321.4
T5	530063.9	642171.6
T4	530231.4	642541.9
T6	530454.0	642876.1

APPENDIX B – Field Survey Findings

Appendix B – Field Survey Findings

The telecom mast-sites surveyed for this Telecoms Impact Study are shown relative to the proposed wind farm site in Figure 11 below.

Figure 11. Telecom Mast-Sites shown relative to proposed Wind Farm

The findings from the field surveys of each of the mast-sites are presented below.

Mast-Site A (Ballymurragh East)

Telecommunications Mast-Site A is located in the townland of Ballymurragh East, and is approximately 14km southwest of the proposed wind farm. There are three mast structures at this telecoms mast-site. A summary of the Field Survey findings for each of these masts (Mast A1, Mast A2 and Mast A3) is provided below.

Mast A1

Telecommunications Mast A1 is shown in the figure below. The Telecom Operators who have indicated that they have radio link(s) operating from this mast in the direction of the proposed wind farm are listed in Table 9.

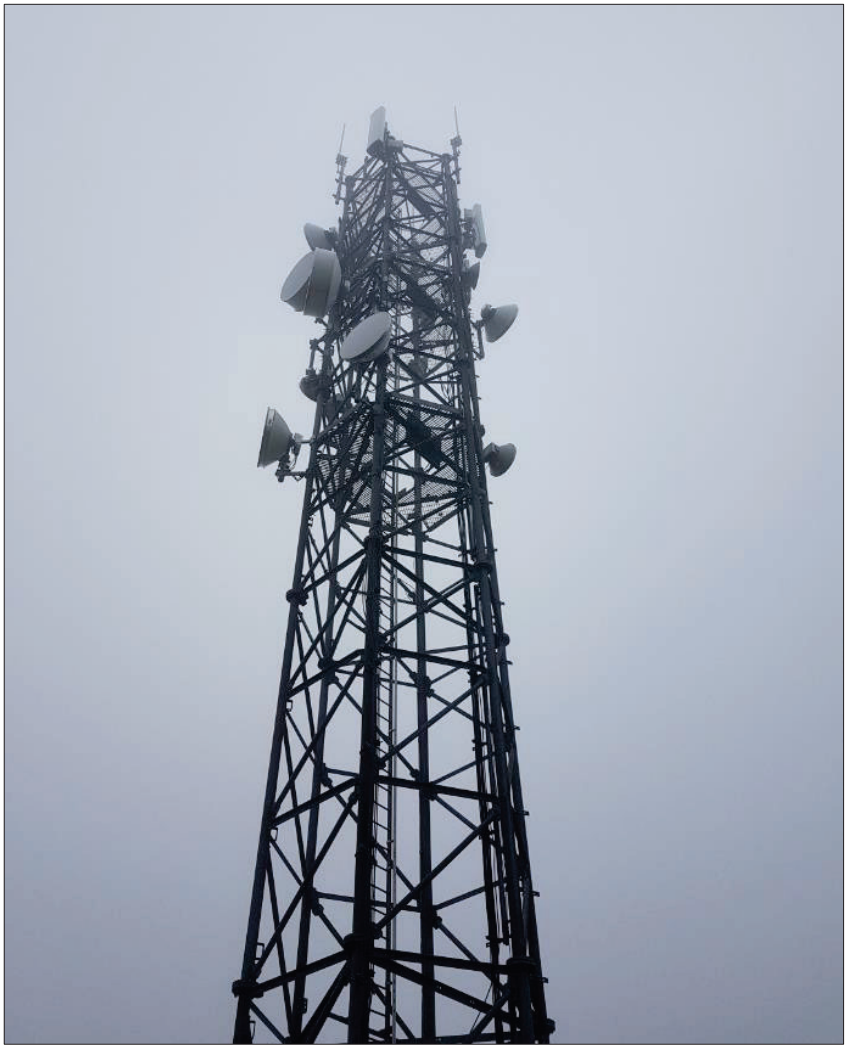


Figure 12. Mast A1

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast A	Vodafone Ireland

Table 9. Field Survey Summary – Mast A1

Mast A2

Telecommunications Mast A2 is shown in the figure below. The Telecom Operators who have indicated that they have radio links operating from this mast in the direction of the proposed wind farm are listed in Table 10.

Figure 13. Mast A2

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast A2	None

Table 10. Field Survey Summary – Mast A2

Mast A3

Telecommunications Mast A3 is shown in the figure below. The Telecom Operators who have indicated that they have radio links operating from this mast in the direction of the proposed wind farm are listed in Table 11.

Figure 14. Mast A3

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast A3	None

Table 11. Field Survey Summary – Mast A3

Mast-Site B (Askeaton)

Telecommunications Mast-Site B is located at the rear of a farmer's shed just south of the town of Askeaton. The mast-site is approximately 7km northeast of the proposed wind farm site. A photo of the mast-structure at this location is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the proposed wind farm are listed in Table 12.

Figure 15. Mast B

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast B	Vodafone Ireland

Table 12. Field Survey Summary – Mast B

Mast-Site C (Moneypoint Generating Station)

Telecommunications Mast-Site C is located at the ESB Moneypoint Generating Station, Co Clare, and is approximately 27km northwest of the proposed wind farm. ESB Networks have a microwave radio link antenna installed on one of their boiler-houses. This radio antenna transmits/receives radio signals from their site at Ballingarry via a Parabolic Reflector Dish which is installed on the adjacent chimney stake, as shown below.

A photo of the mast-structures at Moneypoint is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the proposed wind farm are listed in Table 13.

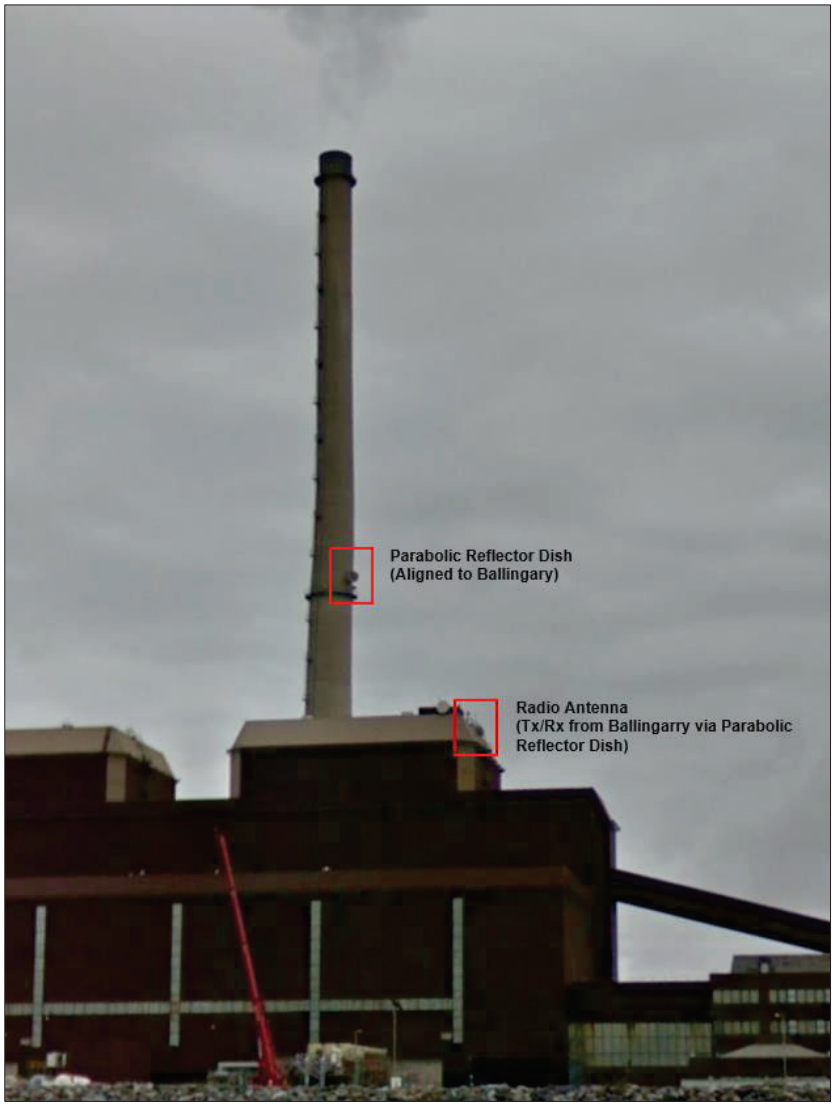


Figure 16. Mast C

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast C	ESB Networks

Table 13. Field Survey Summary – Mast C

Mast-Site D (Ballingarry ESB)

Telecommunications Mast-Site A is located in the townland of Ballingarry and is approximately 16km southeast of the proposed wind farm. Access into the mast-site was not possible on the day of survey; however a roadside view of the telecoms mast structure at this site is shown in the figure below. The Telecom Operators who have radio links operating from this mast-site in the direction of the proposed wind farm are listed in Table 14.

Figure 17. Mast D

Mast ID	Telecom operators with radio links in direction of proposed wind farm
Mast D	ESB Networks

Table 14. Field Survey Summary – Mast D