

Environmental Impact Assessment Report

# Cummeennabuddoge Wind Farm

## Technical Appendix 16-1 Telecoms Impact Study

# Cummeennabuddoge Wind (DAC)

September 2024



AiBridges Total Broadband Solutions	Procedure: 001	Rev: 2.0
Title: Cummennabuddoge WF Telecommunications Impact Study	Approved: KH	Date: 11/08/22

## **Section 5 - Desktop Survey Analysis**

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## 5. Introduction

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

- 5.1 ESB Network
- 5.2 2RN Network
- 5.3 Virgin Media Network
- 5.4 Vodafone Network
- 5.5 Enet Network

## 5.1 ESB Network Analysis

The Enet network in the vicinity of the proposed wind farm consists of one Point-to-Point (PTP) microwave radio link and the Point-to-Multipoint (PMP) radio links. Each of the radio links are listed in Table 4 and a Plan View of the ESB network is shown in Figure 11.

ID	Operator	Description
1	ESB	Mullaghanish - Knockmoyle (PTP)
2	ESB	Mullaghanish - Gneeves 38 kV (PMP)
3	ESB	Mullaghanish - Caherdowney MV (PMP)
4	ESB	Mullaghanish - Newmarket 38kV (PMP)

Table 4. ESB Links requiring Analysis

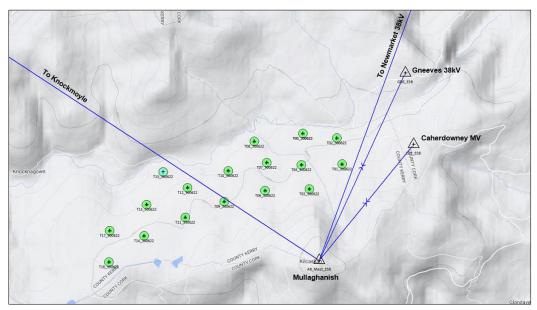


Figure 11. Plan View of the ESB Radio Network

A desktop analysis\* for each of the ESB links has been carried out, the results of which are provided below in Section 5.1.1 to Section 5.1.4.

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

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## 5.1.1 ESB Link 1 Analysis (Mullaghanish – Knockmoyle)

Figure 12 below shows the ESB microwave radio link between Mullaghanish and Knockmoyle. Desktop survey analysis shows that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

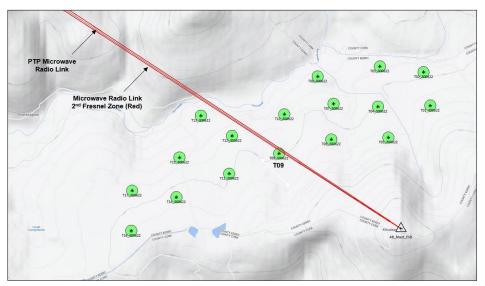


Figure 12. ESB Link 1 (Mullaghanish to Knockmoyle) - Close-up Plan View

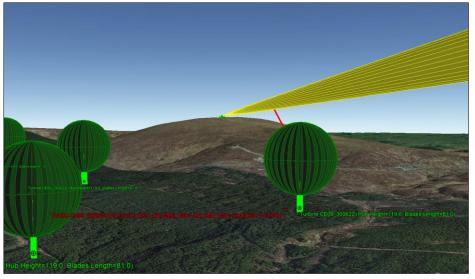


Figure 13. ESB Link 1 (Mullaghanish to Knockmoyle) - Radio Link Model

#### Analysis Results:

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

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T09 = 43.05m)
Mitigation Measures	None required.

Table 5. ESB Link 1 (Mullaghanish to Knockmoyle) – Analysis Summary

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## 5.1.2 ESB Link 2 Analysis (Mullaghanish - Gneeves 38 kV)

Figure 14 below shows the ESB PMP radio link from Mullaghanish to Gneeves. Desktop survey analysis shows that that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

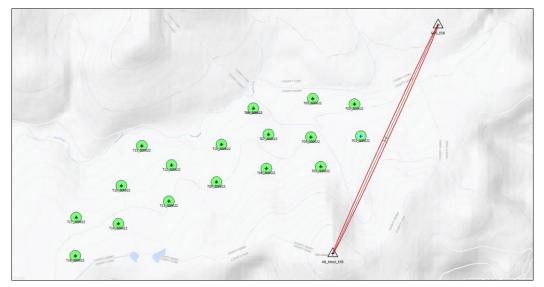


Figure 14. ESB Link 2 (Mullaghanish to Gneeves) - Close-up Plan View

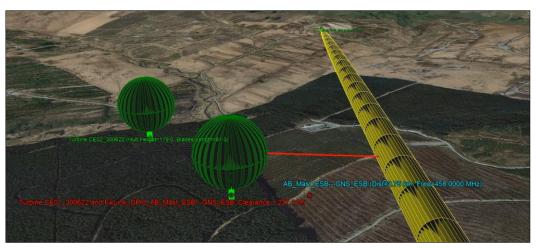


Figure 15. ESB Link 2 (Mullaghanish to Gneeves) - Radio Link Model

#### Analysis Results:

Table 6 below provides a brief summary of the Network Analysis findings for ESB Link 2.

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T01 = 237.11m)
Mitigation Measures	None required.

Table 6. ESB Link 2 (Mullaghanish to Gneeves) – Analysis Summary

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## 5.1.3 ESB Link 3 Analysis (Mullaghanish - Caherdowney MV)

Figure 16 below shows the ESB PMP radio link from Mullaghanish to Caherdowney. Desktop survey analysis shows that that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.



Figure 16. ESB Link 3 (Mullaghanish to Caherdowney) - Close-up Plan View



Figure 17. ESB Link 3 (Mullaghanish to Caherdowney) - Radio Link Model

#### **Analysis Results:**

Table 7 below provides a brief summary of the Network Analysis findings for ESB Link 3.

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T01 > 500m)
Mitigation Measures	None required.

Table 7. ESB Link 3 (Mullaghanish to Caherdowney) – Analysis Summary

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### 5.1.4 ESB Link 4 Analysis (Mullaghanish - Newmarket 38kV)

Figure 18 below shows the ESB PMP radio link from Mullaghanish to Newmarket 38kV. Desktop survey analysis shows that that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

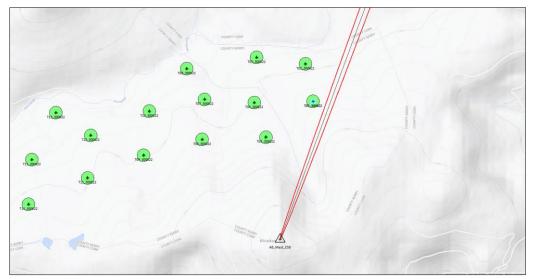


Figure 18. ESB Link 4 (Mullaghanish to Newmarket) - Close-up Plan View

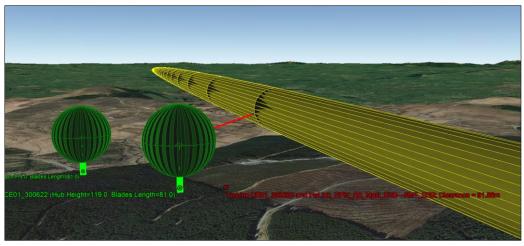


Figure 19. ESB Link 4 (Mullaghanish to Newmarket) - Radio Link Model

#### Analysis Results:

Table 8 below provides a brief summary of the Network Analysis findings for ESB Link 4.

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T01 = 91.86m)
Mitigation Measures	None Required

Table 8. ESB Link 4 (Mullaghanish to Newmarket) – Analysis Summary

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## 5.2 2RN Network Analysis

The 2RN network in the vicinity of the proposed wind farm consists of eight communications link paths. The radio link paths are listed in Table 9 and a Plan View of the 2RN network is shown in Figure 20.

ID	Operator	Description	
1	2RN	Mullaghanish – Dingle (1 x PTP DTT Radio Link)	
2	2RN	Mullaghanish – Maamclassach (1 x PTP DTT Radio Link & 1 x PTP FM Radio Link )	
3	2RN	Mullaghanish – Knockmoyle (1 x PTP DTT Radio Link & 1 x PTP FM Radio Link )	
4	2RN	Mullaghanish – Fermoy (1 x PTP DTT Radio Link & 1 x PTP FM Radio Link )	
5	2RN	Mullaghanish – Casteltown (2 x PTP Microwave Radio Links)	
6	2RN	Mullaghanish – Kildorrey (2 x PTP Microwave Radio Links)	
7	2RN	Mullaghanish – Ballydavid (1 x PTP FM Radio Link)	
8	2RN	Mullaghanish – Knockanore (1 x PTP FM Radio Link)	

Table 9. 2RN Communications Link Paths requiring Analysis

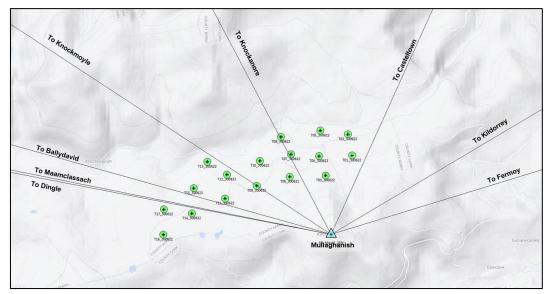


Figure 20. Plan View of the 2RN Radio Network

A desktop analysis\* for each of the 2RN communications link paths has been carried out, the results of which are provided below in Section 5.2.1 to Section 5.2.8.

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

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## 5.2.1 2RN Link 1 Analysis (Mullaghanish – Dingle)

Figure 21 below shows the 2RN DTT link between Mullaghanish and Dingle. Desktop survey analysis shows that that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

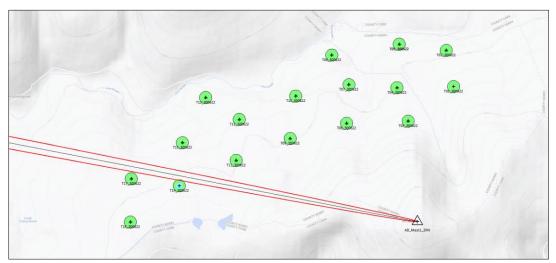


Figure 21. 2RN Link 1 (Mullaghanish to Dingle) - Close-up Plan View

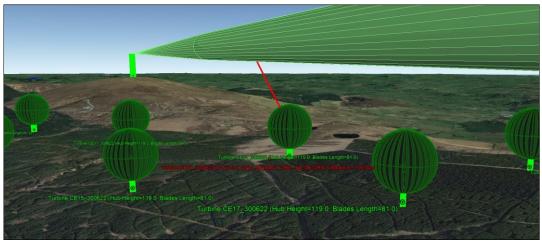


Figure 22. 2RN Link 1 (Mullaghanish to Dingle) - Radio Link Model

#### Analysis Results:

Table 10 below provides a brief summary of the Network Analysis findings for 2RN Link 1.

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T14 = 190 m)
Mitigation Measures	None required.

Table 10. 2RN Link 1 (Mullaghanish to Dingle) – Analysis Summary

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### 5.2.2 2RN Link 2 Analysis (Mullaghanish – Maamclassach)

Figure 22 below shows the 2RN radio link (DTT and FM) between Mullaghanish and Maamclassach. Desktop survey analysis shows that that the Fresnel Zones of these radio links are sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

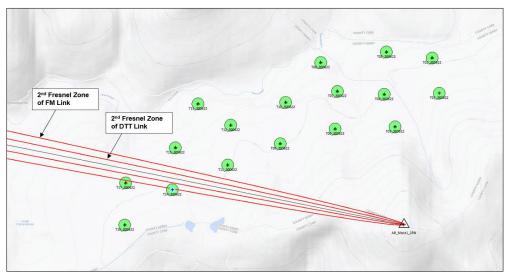


Figure 23. 2RN Link 2 (Mullaghanish to Maamclassach) - Close-up Plan View

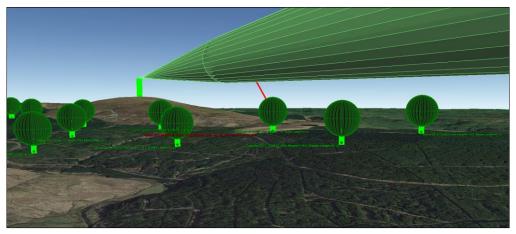


Figure 24. 2RN Link 2 (Mullaghanish to Maamclassach) - Radio Link Model

#### Analysis Results:

Table 11 below provides a brief summary of the Network Analysis findings for 2RN Link 2.

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T14 > 128.89m)
Mitigation Measures	None required.

Table 11 2RN Link 2 (Mullaghanish to Maamclassach) – Analysis Summary

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## 5.2.3 2RN Link 3 Analysis (Mullaghanish – Knockmoyle)

Figure 25 below shows the 2RN radio link (DTT and FM) from Mullaghanish to Knockmoyle. Desktop survey analysis shows that that the Fresnel Zones of these radio links are sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

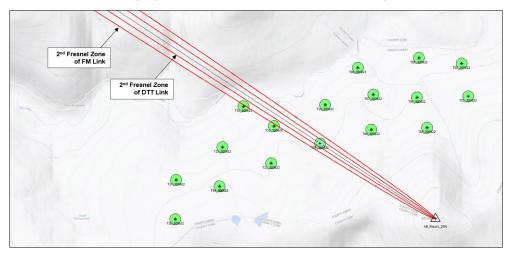


Figure 25. 2RN Link 3 (Mullaghanish to Knockmoyle) - Close-up Plan View

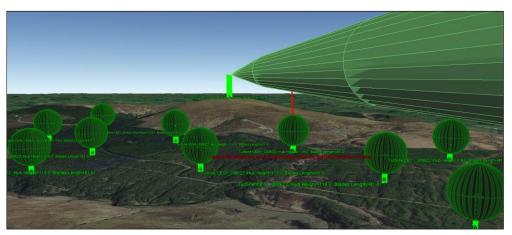


Figure 26. 2RN Link 3 (Mullaghanish to Knockmoyle) - Radio Link Model

#### Analysis Results:

Table 12 below provides a brief summary of the Network Analysis findings for 2RN Link 3.

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T09 > 120.5m)
Mitigation Measures	None required.

Table 12. 2RN Link 3 (Mullaghanish to Knockmoyle) – Analysis Summary

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## 5.2.4 2RN Link 4 Analysis (Mullaghanish – Fermoy)

Figure 27 below shows the 2RN microwave radio link (DTT and FM) from Mullaghanish to Fermoy. Desktop survey analysis shows that that the Fresnel Zones of these radio links are sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

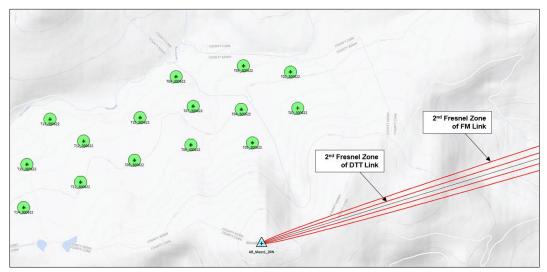


Figure 27. 2RN Link 4 (Mullaghanish to Fermoy) - Close-up Plan View

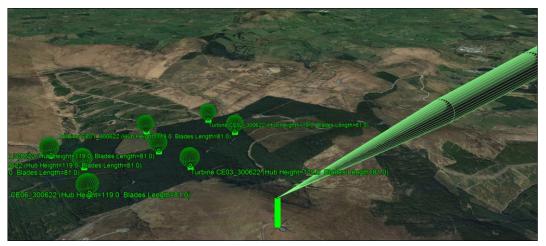


Figure 28. 2RN Link 4 (Mullaghanish to Fermoy) - Radio Link Model

#### Analysis Results:

Table 13 below provides a brief summary of the Network Analysis findings for 2RN Link 4.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine > 500m)
Mitigation Measures	None required.

Table 13. 2RNLink 4 (Mullaghanish to Fermoy) – Analysis Summary

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## 5.2.5 2RN Link 5 Analysis (Mullaghanish - Castletown)

Figure 29 below shows the 2RN PTP radio link (2x PTP) from Mullaghanish to Castletown. Desktop survey analysis shows that that the Fresnel Zones of these radio links are sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

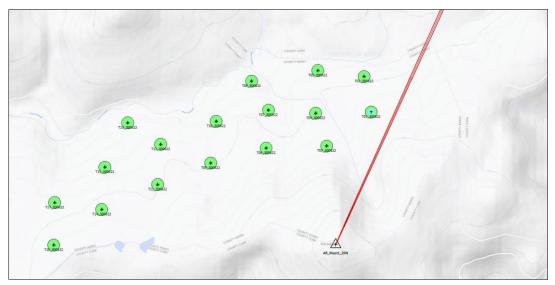


Figure 29. 2RN Link 5 (Mullaghanish to Castletown) - Close-up Plan View

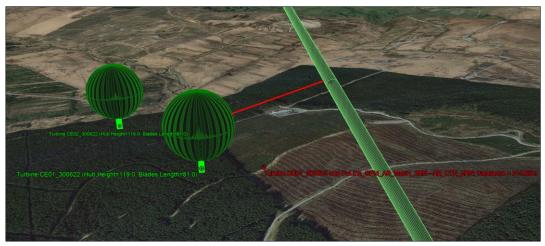


Figure 30. 2RN Link 5 (Mullaghanish to Castletown) - Radio Link Model

#### Analysis Results:

Table 14 below provides a brief summary of the Network Analysis findings for 2RN Link 5.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T01 > 200 m)
Mitigation Measures	None Required

Table 14. 2RN Link 5 (Mullaghanish to Castletown) – Analysis Summary

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## 5.2.6 2RN Link 6 Analysis (Mullaghanish – Kildorrey)

Figure 31 below shows the 2RN microwave radio link from Mullaghanish to Kildorrey. Desktop survey analysis shows that that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

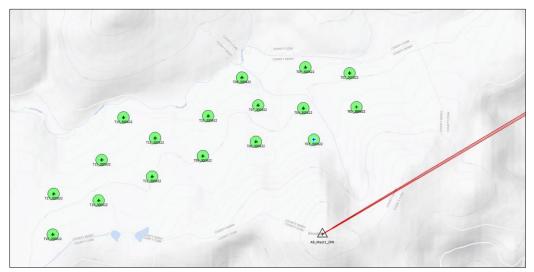


Figure 31. 2RN Link 6 (Mullaghanish to Kildorrey) - Close-up Plan View



Figure 32. 2RN Link 6 (Mullaghanish to Kildorrey) - Radio Link Model

#### Analysis Results:

Table 15 below provides a brief summary of the Network Analysis findings for 2RN Link 6.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T01 > 500m)
Mitigation Measures	None required.

Table 1. 2RNLink 4 (Mullaghanish to Kildorrey) – Analysis Summary

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## 5.2.7 2RN Link 7 Analysis (Mullaghanish – Ballydavid)

Figure 33 below shows the 2RN FM radio link from Mullaghanish to Ballydavid. Desktop survey analysis shows that that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

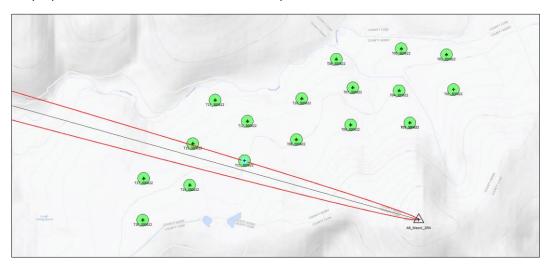


Figure 33. 2RN Link 7 (Mullaghanish to Ballydavid) - Close-up Plan View

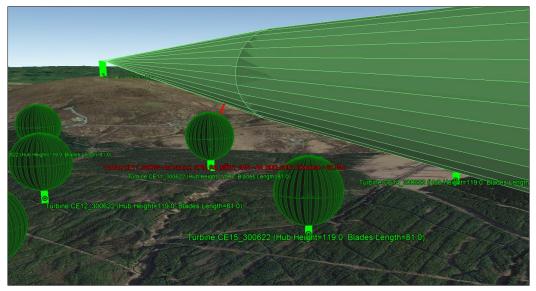
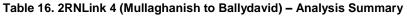


Figure 1. 2RN Link 7 (Mullaghanish to Ballydavid) - Radio Link Model

#### Analysis Results:

Table 16 below provides a brief summary of the Network Analysis findings for 2RN Link 7.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T11 = 38.75 m)
Mitigation Measures	None required.



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## 5.2.8 2RN Link 8 Analysis (Mullaghanish – Knockanore)

Figure 35 below shows the 2RN FM radio link from Mullaghanish to Knockanore. Desktop survey analysis shows that that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

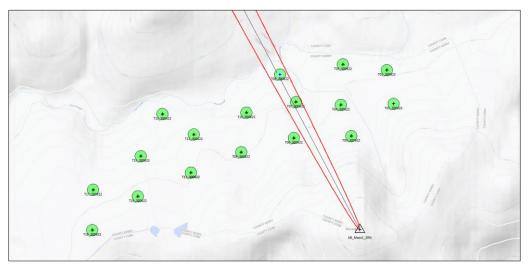


Figure 35. 2RN Link 8 (Mullaghanish to Knockanore) - Close-up Plan View

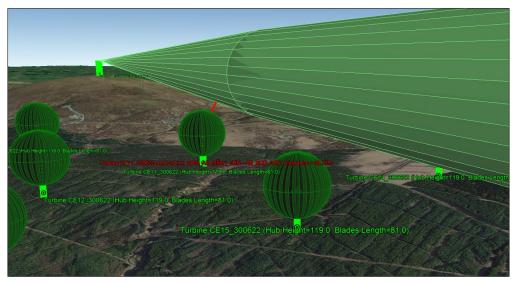


Figure 36. 2RN Link 8 (Mullaghanish to Knockanore) - Radio Link Model

#### Analysis Results:

Table 17 below provides a brief summary of the Network Analysis findings for 2RN Link 8.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T08 = 36.44m)
Mitigation Measures	None required.

Table 2. 2RNLink 4 (Mullaghanish to Ballydavid) – Analysis Summary

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## 5.3 Virgin Media Network Analysis

The Virgin Media network in the vicinity of proposed wind farm consists of one Point-to-Point (PTP) microwave radio link. The radio link is listed below in Table 18. A Plan View of the Virgin Media network is shown in Figure 37.

ID	Operator	Description
1	Virgin Media	Mullaghanish – Carron Mt PTP Microwave Radio Link

Table 3. Virgin Media Links requiring Analysis

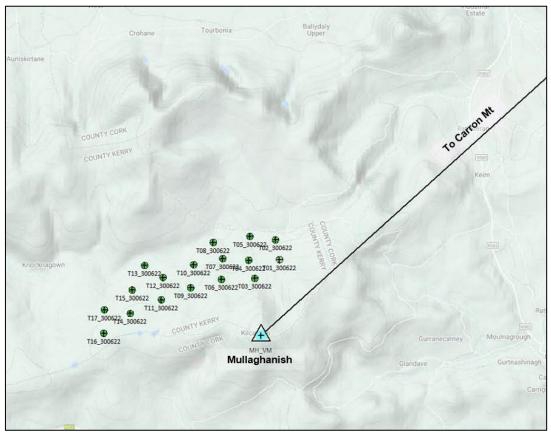


Figure 2. Plan View of the Virgin Media Radio Network

A desktop analysis\* for each of the Virgin Media links has been carried out, the results of which are provided below in Section 5.3.1.

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## 5.3.1 Virgin Media Link 1 Analysis (Mullaghanish – Carron Mt)

Figure 38 below shows the Virgin Media microwave radio link from Mullaghanish to Carron Mt. Desktop survey analysis shows that this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

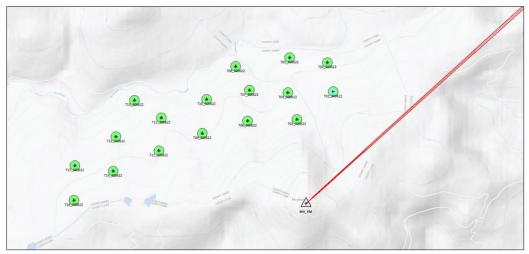


Figure 38. Virgin Media Link 1 (Mullaghanish to Carron Mt) - Close-up Plan View

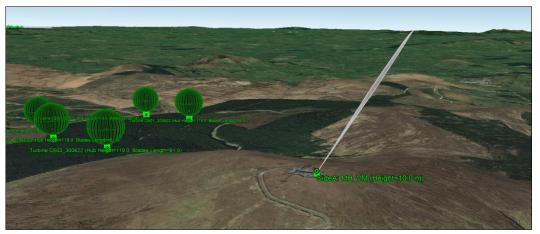


Figure 39. Virgin Media Link 1 (Mullaghanish to Carron Mt) - Radio Link Model

#### Analysis Results:

Table 19 below provides a brief summary of the Network Analysis findings for Virgin Media Link 1.

Wind Farm Impacts	No Impacts. (Clearance Distance to nearest Turbine T01 > 500m)
Mitigation Measures	None required.

Table 4. Virgin Media Link 1 (Mullaghanish to Carron Mt) – Analysis Summary

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## 5.4 Vodafone Network Analysis

The Vodafone network in the vicinity of proposed wind farm consists of two Point-to-Point (PTP) microwave radio links. The radio link is listed below in Table 20. A Plan View of the Vodafone network is shown in Figure 40.

	ID	Operator	Description
ſ	1	Vodafone	Mullaghanish – Curragh Wind Farm PTP Microwave Radio Link
	2	Vodafone	Mullaghanish – Garraneduff PTP Microwave Radio Link

Table 5. Vodafone Links requiring Analysis

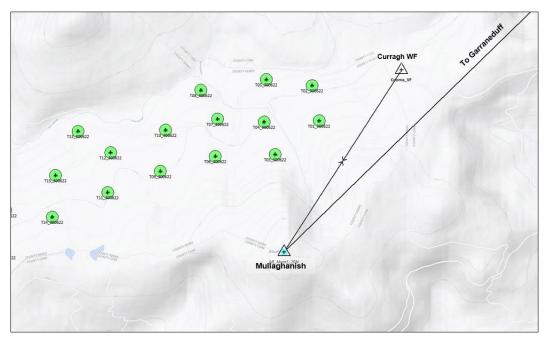


Figure 40. Plan View of the Vodafone Radio Network

A desktop analysis\* for each of the Vodafone links has been carried out, the results of which are provided below in Section 5.4.1 and Section 5.4.2

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

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## 5.4.1 Vodafone Link 1 Analysis (Mullaghanish – Curragh WF)

Figure 41 below shows the Vodafone microwave radio link from Mullaghanish to Curragh Wind Farm. Desktop survey analysis shows that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.



Figure 3. Vodafone Link 1 (Mullaghanish to Curragh WF) - Close-up Plan View

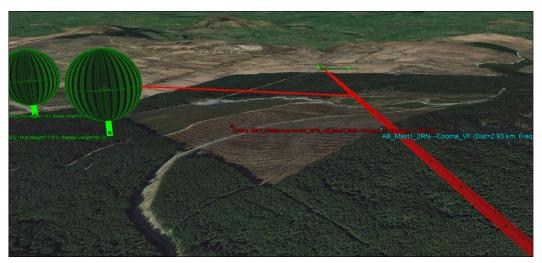


Figure 42. Vodafone Link 1 (Mullaghanish to Curragh WF) - Radio Link Model

#### Analysis Results:

Table 21 below provides a brief summary of the Network Analysis findings for Vodafone Link 1.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T01 = 476.72m)
Mitigation Measures	None required.

Table 6. Vodafone Link 1 (Mullaghanish to Curragh WF) – Analysis Summary

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## 5.4.2 Vodafone Link 2 Analysis (Mullaghanish – Garraneduff)

Figure 43 below shows the Vodafone microwave radio link from Mullaghanish to Garraneduff. Desktop survey analysis shows that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

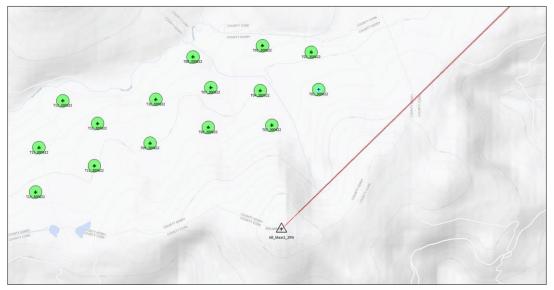


Figure 43. Vodafone Link 2 (Mullaghanish to Garraneduff) - Close-up Plan View

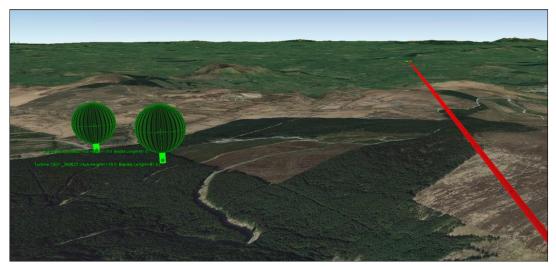
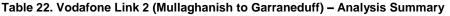


Figure 44. Vodafone Link 2 (Mullaghanish to Garraneduff) - Radio Link Model

#### Analysis Results:

Table 22 below provides a brief summary of the Network Analysis findings for Vodafone Link 2.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T01 > 500m)
Mitigation Measures	None required.



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## 5.5 Enet Network Analysis

The Enet network in the vicinity of the proposed wind farm consists of four Point-to-Point (PTP) microwave radio links. The radio links are listed in Table 23 and a Plan View of the Enet network is shown in Figure 45.

ID	Operator	Description
1	Enet	Mullaghanish – Knockmoyle PTP Microwave Radio Link
2	2 Enet Mullaghanish – Airtricity Cork PTP Microwave Radio Link	
3	3 Enet Mullaghanish – Gneeves WF PTP Microwave Radio Link	
4	Enet	Mullaghanish – Caherdowney PTP Microwave Radio Link

Table 23. Enet Links requiring Analysis

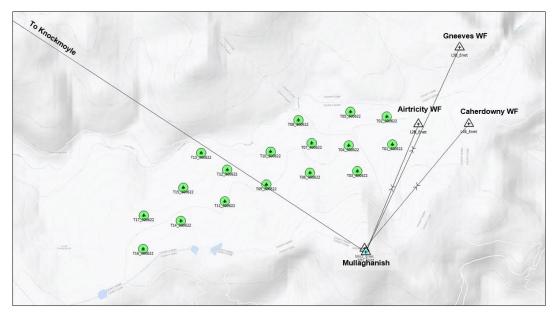


Figure 4. Plan View of the Enet Radio Network

A desktop analysis\* for each of the Enet links has been carried out, the results of which are provided below in Section 5.5.1 to Section 5.5.4.

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

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## 5.5.1 Enet Link 1 Analysis (Mullaghanish – Knockmoyle)

Figure 46 below shows the Enet microwave radio link from Mullaghanish to Knockmoyle. Desktop survey analysis shows that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

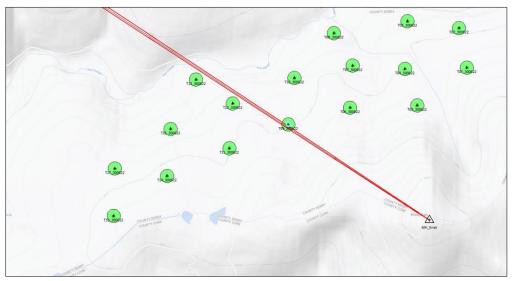


Figure 5. Enet Link 1 (Mullaghanish to Knockmoyle) - Close-up Plan View

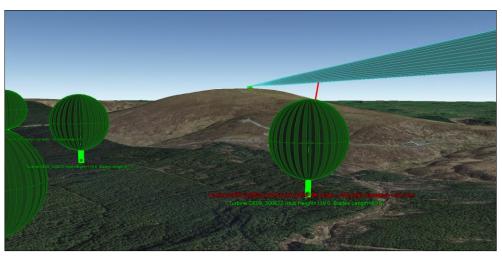


Figure 6. Enet Link 1 (Mullaghanish to Knockmoyle) - Radio Link Model

#### Analysis Results:

Table 24 below provides a brief summary of the Network Analysis findings for Enet Link 1.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T09 = 34.12m)
Mitigation Measures	None Required

Table 7. Enet Link 1 (Mullaghanish to Knockmoyle) – Analysis Summary

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## 5.5.2 Enet Link 2 Analysis (Mullaghanish – Airtricity, Cork)

Figure 48 below shows the Enet radio link from Mullaghanish to Airtricity, Cork. Desktop survey analysis shows that this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

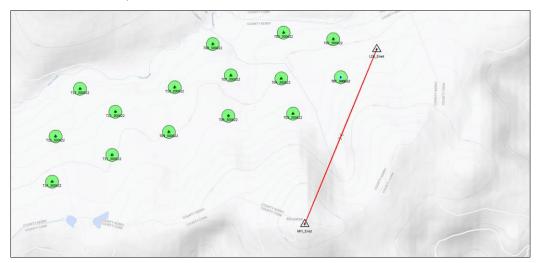


Figure 7. Enet Link 2 (Mullaghanish to Airtricity, Cork) - Close-up Plan View

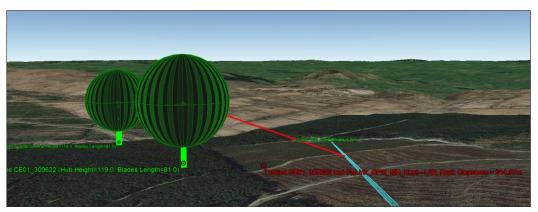
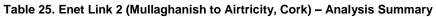


Figure 49. Enet Link 2 (Mullaghanish to Airtricity, Cork) - Radio Link Model

#### Analysis Results:

Table 25 below provides a brief summary of the Network Analysis findings for Enet Link 2.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T01 = 214.97m)
Mitigation Measures	None required.



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## 5.5.3 Enet Link 3 Analysis (Mullaghanish – Gneeves WF)

Figure 50 below shows the Enet radio link from Mullaghanish to Gneeves Wind Farm. Desktop survey analysis shows that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.



Figure 50. Enet Link 3 (Mullaghanish to Gneeves WF) - Close-up Plan View

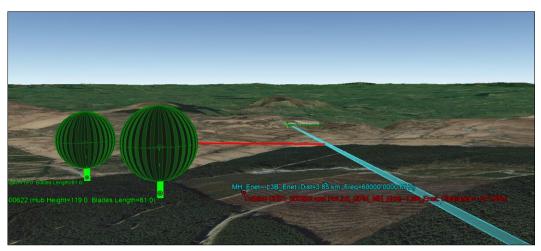


Figure 51. Enet Link 3 (Mullaghanish to Gneeves WF) - Radio Link Model

#### Analysis Results:

Table 26 below provides a brief summary of the Network Analysis findings for Enet Link 3.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T01 = 271.65m)
Mitigation Measures	None Required

Table 8. Enet Link 3 (Mullaghanish to Gneeves WF) – Analysis Summary

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## 5.5.4 Enet Link 4 Analysis (Mullaghanish – Caherdowney WF)

Figure 52 below shows the Vodafone microwave radio link from Mullaghanish to Caherdowney Wind Farm. Desktop survey analysis shows that the Fresnel Zone of this radio link is sufficiently far from the nearest of the proposed turbines, that there will be no impacts.

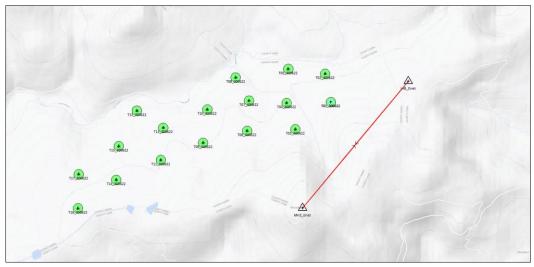


Figure 52. Enet Link 4 (Mullaghanish to Caherdowney WF) - Close-up Plan View

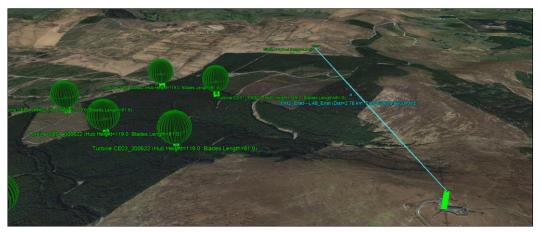


Figure 53. Enet Link 4 (Mullaghanish to Caherdowney WF) - Radio Link Model

#### Analysis Results:

Table 27 below provides a brief summary of the Network Analysis findings for Enet Link 4.

Wind Farm Impacts	No impacts. (Clearance Distance to nearest Turbine T01 > 500m
Mitigation Measures	None Required.

Table 9. Enet Link 4 (Mullaghanish to Caherdowney WF) – Analysis Summary

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