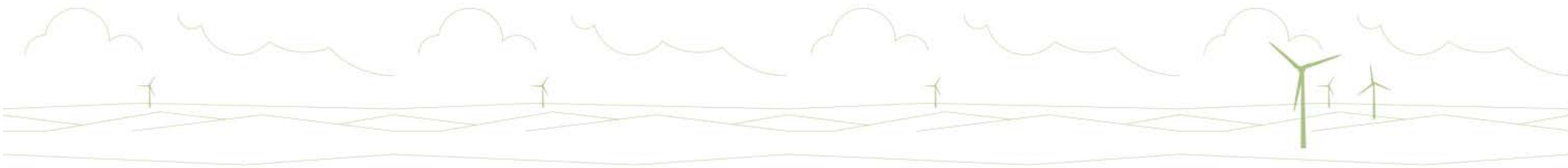
Additional Information 2

Technical Update Report

Table of contents



List of Figures

List of Technical Appendices

Additional Information 2: Technical Update

1.1 Introduction

1. ScottishPower Renewables (UK) Ltd (SPR)(hereinafter referred to as the 'the Applicant') submitted an application to the Scottish Government's Energy Consents Unit (ECU) under *Section 36* of *the Electricity Act 1989 (as amended)* in December 2019 (ECU application reference: ECU00001996) which sought consent and deemed planning permission to construct and operate an extension to the Operational Kilgallioch Windfarm (hereinafter referred to as the 'proposed Development'). The proposed Development is located at a site centred on British National Grid (BNG) reference BNG (223950, 570150) as shown on **Figure 1.1** of the **EIA Report** (2019).

2. In January 2021, additional information (AI1) was submitted to the ECU following discussions with the ECU and other stakeholders, withdrawing the solar component of the application.

3. This Report provides additional information (AI2) in support of further changes to the proposed Development layout (hereinafter referred to as the 'revised proposed Development') as a result of further detailed consultation with Historic Environment Scotland (HES) and concerns raised in respect to potential effects on the setting of Wood Cairn, cairn, Eldrig Fell (Scheduled Monument, SM1953).

4. This Report presents revised environmental impact assessments of the revised proposed Development. The additional information supplements the information and findings of the EIA Report submitted as part of the Section 36 application in 2019 and should therefore be read alongside the EIA Report. The conclusions of the EIA Report (2019) remain valid except where otherwise stated within this Report or its accompanying figures and appendices.

5. This Report has been prepared by the same competent experts as the EIA Report (2019).

1.1.1 Changes to the Proposed Development

6. The revised proposed Development layout includes the removal of two turbines (T1 and T11) within the eastern extent of the Site and associated infrastructure. This removal of turbines has arisen following receipt of the consultation responses made by Historic Environment Scotland (HES) on 17 April 2020 and 10 February 2021 relating to the original application and more recently on 23 August 2021 in relation to the proposed revisions where they advised:

'We consider that… the deletion of turbines 1 and 11 from the Kilgallioch Wind Farm Extension scheme is likely to reduce impacts on the setting of Wood Cairn, cairn, Eldrig Fell (Scheduled Monument, SM1953) to an acceptable level. We would therefore be content to withdraw our objection the proposals following consultation on a Further Environmental Information submission detailing these changes.'

7. A revised **Chapter 4: Development Description** (as relevant figures) detailing changes to the proposed Development is provided alongside this Report as part of the package of additional information (AI2).

1.1.2 Changes to the Cumulative Baseline

8. In addition, due to the time that has elapsed since the Section 36 application was submitted, a number of changes to the cumulative windfarm situation have arisen within the study area. The Applicant therefore considered it prudent to provide an updated cumulative impact assessment that takes account of this. The detailed 20 km radius study area assessed in detail within **EIA Report Chapter 6: Landscape and Visual** has been considered in this review of cumulative effects as it is within this relatively local context that any significant cumulative effects may arise. The cut-off date for consideration of any revised cumulative information was 27 August 2021.

9. The changes to the proposed Development's cumulative baseline since the submission of the Section 36 application (2019) are as follows:

- New Application sites – Artfield Forest and Garvill windfarms; and.
- New Scoping sites – Aries II; Dervaird; Knockodhar; and Mid Moile windfarms.

10. The new scoping sites will not form part of this additional information (AI2) (or appear in updated wirelines) but will appear on the cumulative update map and shown on **Figure Add2 3**. The Gass Windfarm development was removed from the EIA Report as consent had lapsed, and it has not been re-included within this Report.

1.2 Landscape and Visual

1.2.1 Introduction

11. This Addendum report revises the findings of significance reported in the landscape and visual impact assessment for the proposed Development, which forms part of the submitted **EIA Report** (**Chapter 6: Landscape and Visual**). It should be read in conjunction with EIA Report Chapter 6, which provides relevant baseline information and evaluation, and in conjunction with an updated **AI2 Chapter 4 Update: Development Description**.

12. The cumulative update reviews the cumulative effects of the revised proposed Development on the landscape resource - both direct effects and effects on how the landscape is perceived - and the effect on visual amenity (views) within the study area.

13. The addendum applies the Methodology set out in **Technical Appendix TA6.1** of the **EIA Report**.

14. This addendum is supported by figures and viewpoint wireline visualisations however, reference should be made to Figures within the EIA Report for further information and comparison. Specifically, **EIA Report Figures 6.3a** and **b** and **6.4** which are the landscape character and landscape planning designations figures are useful for gaining an understanding of how the application stage cumulative wind energy sites relate to these. For ease of cross reference, viewpoint figure numbers have remained as they were within the EIA Report and have been given the prefix 'Add2' to denote they are part of this additional information (AI2).

15. The operational/ under construction wind energy development context included in the baseline is unchanged from that considered and set out in **EIA Report Section 6.5.4.2** of **Chapter 6**.

1.2.2 Revised Landscape Effects

1.2.2.1 Physical Effects

16. The revised proposed Development reduces the physical effects on the landscape features, area of moorland, within the Site. The physical landscape effects of the revised proposed Development on these landscape elements are considered to be **not significant**.

1.2.2.2 Landscape Character Effects

17. The geographical extent of the revised proposed Development within the Plateau Moorland with Forest LCT (17a), Glentrool unit is reduced in the south-eastern part of the Site. However, whilst there may be a slight reduction in the geographical area over which the magnitude of change is assessed to be high locally, reducing to medium in the wider area. This does not alter the findings of Chapter 6 which were summarised in **EIA Report Section 6.9.2** as follows:

'*The LVIA has identified significant effects for localised parts of the landscape character areas that cover the Site and its immediate surroundings. The addition of the proposed Development would increase the extent of a 'landscape with windfarms' characteristic for the immediately surrounding landscape context and the historic land-use characteristic within the localised site area would be partly diminished. Significant effects within the Plateau Moorland with Forest LCT (17a), Glentrool unit would extend to around 2-3 km from around the site boundary. The significant effects are highly localised in this way because the introduction of large scale wind turbines, associated infrastructure and solar array to an area of moorland landscape that already contains such an extensive amount of*

other large scale windfarm development substantially moderates the magnitude of change in the wider area of the host LCT and also at the neighbouring edges of other nearby LCTs.

At greater distances, the effect on landscape character would not be significant due to the level of screening from intervening landform such as upland ridgelines and interconnecting hills that contain views of the Site from the surrounding landscape, such as the large scale Galloway Hills and Merrick range to the east and screening by other landscape elements such as the large degree of commercial forest in the immediate and wider surrounding landscape context.

None of the landscape designations within the Study Area were found to have significant effects as a result of the proposed Development. It is also considered that the Galloway Forest Park, Merrick Wild Land Area or Dark Sky Park do not have potential for significant effects.'

18. Since the landscape character assessment within **EIAR Report Chapter 6** was prepared, the South Ayrshire Scenic Areas have been replaced by Local Landscape Areas (LLAs). It is notable that the Stinchar Valley LLA, which partly covers the Duisk Valley area of the previously designated South Ayrshire Scenic Area, is set much further back from the revised proposed Development than the Scenic Area. None of the Duisk Valley to the south of Barrhill is included in the LLA and it is focussed more on the valley floor than valley sides in comparison to the previously designated South Ayrshire Scenic Area. This retraction of designated area from the landscape to the north of the Site results in the LLA designation being far less affected than previously assessed in the EIA Report and it is considered that there is **no potential for significant effects** to the Stinchar Valley LLA.

1.2.3 Revised Visual Effects

1.2.3.1 Effects on Views

19. The effects on views are assessed through the preparation of visualisations and assessment of the effects on a series of representative viewpoints as well as also assessment of effects on the views of principal visual receptors such as people using footpaths and roads. In this instance the focus of the effects was on users of the Southern Upland Way Long Distance Route.

20. The reduction in the number of turbines in the revised proposed Development will locally reduce its visual impact and therefore its effect on the representative views and principal receptors. This would be most noticeable from locations to the south-east of the Site where the turbines would be more distant and from the south-west and east where the reduction in the horizontal field of view is most notable. From these locations the revised proposed Development appears more compact and often results in a gap or reduced/ no overlap with the Airies Farm, Artfield Fell/ Balmurrie Fell windfarms, depending on the direction of the view. Whilst the magnitude of change in the views would reduce in all cases it may not be sufficient to alter the magnitude of change level reported or the significance of effect rating.

21. The blade tip Zone of Theoretical Visibility (ZTV) for the revised proposed Development is shown at A1 scale on **Figure Add2 1**. A comparison between the blade tip ZTV of the revised proposed Development and the blade tip ZTV of the EIA Report proposed Development is shown in **Figure Add2 2**. This does not take into account the reduced number of turbines visible. However, it does indicate that the difference in the geographical extents of the areas shown to have theoretical visibility is very slight.

22. **Table 1** sets out the sensitivity, magnitude of change and significance of effect as assessed in detail in **EIA Report Chapter 6**. Alongside this, the change as a result of the reduction in turbine numbers and reduced access track length are noted. Thereafter, the magnitude of change is reassessed as well as any alteration to the significance of effect. There is no change to the sensitivity reported in the EIA Report.

23. A preliminary assessment set out in **EIA Report Table 6.8.2** found that there was no potential for significant effects to arise during the day at the following viewpoints:

- Viewpoint 5 - B7027 Loch Maberry
- Viewpoint 7 - Mains of Larg (New Luce)
- Viewpoint 9 - A75 Dergoals
- Viewpoint 12 - A714 north of Newton Stewart.
- Viewpoint 13 - Mochrum Loch
- Viewpoint 14 - Bruce's Stone, Glen Trool / Dark Sky Park
- Viewpoint 15 - A77 by Cairnpat
- Viewpoint 17 - A75, Point Nets

24. The reduction in the number of turbines would not alter this assessment finding and as a result these viewpoints are not reassessed in **Table 1**.

1.2.3.2 Revised visual effects of lighting

25. The visual effects of turbine lighting were considered from four agreed viewpoints. At night, the turbines would not in themselves be visible during times of darkness. Whilst revised night-time visualisations have not been prepared for these viewpoints, as part of this exercise, reference has been made to the daytime visualisations in order to gain an understanding of what difference the removal of T1 and T11 would make. This comparison is included in **Table 2**.

Receptor	Receptor sensitivity	Operational / under construction baseline				
		Magnitude of change (EIA Report)	Significance of effect (EIA Report)	Change as a result of the reduction of turbines in the revised proposed Development	Revised magnitude of change (AI2)	Revised significance of effect (AI2A)
Visual effects on representative viewpoints						
Viewpoint 01 - Eldrig Fell	Medium – Low	**High**	**Significant**	Closest two turbines of EIA Report proposed Development removed along with their access tracks. This increases the distance to the nearest turbine by 540m. The revised proposed Development remains a close range addition to the windfarm context and spans across approximately 53 degrees of the field of view.	**High**	**Significant**
Viewpoint 02 – SUW (Knockniehourie)	Medium	**High - Medium**	**Significant**	The two turbines that were located in the south-eastern extent of the EIA Report proposed Development have been removed. The horizontal field of view that would be affected by the revised proposed Development is reduced resulting in a reduced additional extent of wind turbines in the view when considered as an addition to Kilgallioch Windfarm. The removal of T1 and T11 also increases the separation distance between the proposed Development and Airies Farm windfarm.	**High - Medium**	**Significant**
Viewpoint 03 – SUW (Craig Airie Fell)	Medium	**High**	**Significant**	The removal of T1 and T11 slightly alters the density of the windfarm and reduces overlapping of proposed Development turbines.	**High**	**Significant**
Viewpoint 04 – SUW (West of Derry)	Medium	**High - Medium**	**Significant**	The two turbines that were located in the south-eastern extent of the EIA Report proposed Development have been removed. The horizontal field of view that would be affected by the revised proposed Development is reduced. The removal of T1 and T11 also increases the separation distance between the proposed Development and Airies Farm windfarm.	**High - Medium**	**Significant**
Viewpoint 06 - Minor Road near Bennylow (Culvennan Fell)	Medium	Low	Not Significant	The revised proposed Development is located entirely beyond the Airies Farm windfarm. Closest two turbines of EIA Report proposed Development removed. This increases the distance to the nearest turbine by 546m. The removal of T1 and T11 slightly alters the density of the windfarm and reduces overlapping proposed Development turbines.	Low	Not Significant
Viewpoint 08 - SUW (Hill of Ochitree)	Medium	Medium	Not Significant	The two turbines that were located in the south-eastern extent of the EIA Report proposed Development have been removed. The horizontal field of view that would be affected by the revised proposed Development is reduced. The removal of T1 and T11 also increases the separation distance between the proposed Development and Balmurrie Fell windfarm.	Medium	Not Significant
Viewpoint 10 - SUW (Glenwhan Moor)	Medium	Low	Not Significant	The two turbines that were located in the south-eastern extent of the EIA Report proposed Development have been removed. The horizontal field of view that would be affected by the revised proposed Development is reduced. The removal of T1 and T11 also increases the separation distance between the proposed Development and Balmurrie Fell windfarm.	Low	Not Significant
Viewpoint 11 – A714, Bargrennan Cottage	Medium - Low	Medium - Low	Not Significant	The two turbines that were located in the south-eastern extent of the EIA Report proposed Development have been removed. The horizontal field of view that would be affected by the revised proposed Development is reduced. The removal of T1 and T11 also increases the separation distance between the proposed Development and Balmurrie Fell windfarm.	Medium - Low	Not Significant
Viewpoint 16 – The Merrick	High	Low - Negligible	Not Significant	The two turbines that were located in the south-eastern extent of the EIA Report proposed Development have been removed. The horizontal field of view that would be affected by the revised proposed Development is reduced. The removal of T1 and T11 also ensures that there is no overlap between Artfield Fell/ Balmurrie Fell windfarms and the revised proposed Development.	Low - Negligible	Not Significant

Receptor	Receptor sensitivity	Operational / under construction baseline				
		Magnitude of change (EIA Report)	Significance of effect (EIA Report)	Change as a result of the reduction of turbines in the revised proposed Development	Revised magnitude of change (AI2)	Revised significance of effect (AI2A)
SUW sequential route assessment	Medium – High (Glen Trool to Bargrennan)	Negligible	Not Significant	The two turbines that were located in the south-eastern extent of the EIA Report proposed Development have been removed. The horizontal field of view that would be affected by the revised proposed Development would appear reduced where visible along this section of route. The removal of T1 and T11 also increases the separation distance between the proposed Development and Balmurrie Fell windfarm, where visible from elevated parts of the route.	Negligible	Not Significant
	Medium (Bargrennan to New Luce)	**High to High-Medium (Knockniehourie to Derry)**	**Significant**	From this section of the route, the removal of T1 and T11 slightly alters the density of the windfarm and reduces overlapping of proposed Development turbines for parts of the route that are to the north of the proposed Development. For parts of this section of the route to the west of the proposed Development, the horizontal field of view that would be affected by the revised proposed Development is reduced resulting in a reduced additional extent of wind turbines in the view when considered as an addition to Kilgallioch Windfarm and the removal of T1 and T11 also increases the separation distance between the proposed Development and Airies Farm windfarm.	**High to High-Medium (Knockniehourie to Derry)**	**Significant**
		Medium to Negligible (other sections)	Not Significant	For these other sections of route to the west of the proposed Development, the horizontal field of view that would be affected by the revised proposed Development is reduced and the removal of T1 and T11 also increases the separation distance between the proposed Development and Balmurrie Fell windfarm.	Medium to Negligible (other sections)	Not Significant

Table 1: Revised Visual Effects

Receptor	Receptor sensitivity at night	2000 Candela Turbine Lights		200 Candela Turbine Lights			2000 Candela Turbine Lights		200 Candela Turbine Lights	
		Magnitude of change (EIA Report)	Significance of effect (EIA Report)	Magnitude of change (EIA Report)	Significance of effect (EIA Report)	Change as a result of the reduction of turbines in the revised proposed Development	Revised magnitude of change	Revised significance of effect	Revised magnitude of change	Revised significance of effect
Visual effects of turbine lighting										
Viewpoint 04 – SUW (West of Derry)	Medium	**High**	**Significant**	**High**	**Significant**	The number of lights is reduced. The horizontal field of view that would be affected by the lighting of the revised proposed Development turbines is reduced.	**High**	**Significant**	**High**	**Significant**
Viewpoint 06 - Minor Road near Bennylow (Culvennan Fell)	Medium	Medium	Not Significant	Medium - Low	Not Significant	Closest two turbines of EIA Report proposed Development removed. This increases the distance to the nearest lit turbine by 546m. The removal of T1 and T11 slightly alters the density of the windfarm lighting across the field of view affected.	Medium	Not Significant	Medium - Low	Not Significant
Viewpoint 14 - Bruce's Stone, Glen Trool / Dark Sky Park	High	**Medium - Low**	**Significant**	Low	Not Significant	The number of lights is reduced. The horizontal field of view that would be affected by the lighting of the revised proposed Development turbines is reduced.	**Medium - Low**	**Significant**	Low	Not Significant
Viewpoint 15 – A77 by Cairnpat	Medium	Medium - Low	Not Significant	Low	Not Significant	The number of lights is reduced. The horizontal field of view that would be affected by the lighting of the revised proposed Development turbines is reduced.	Medium - Low	Not Significant	Low	Not Significant

Table 2: Revised Visual Effects of Lighting

1.2.4 Cumulative Context

1.2.4.1 Scope of revised cumulative assessment

26. **EIA Report Section 6.5.4** sets out the cumulative windfarms included within the consented and application stage scenarios assessed in the EIA Report. The cumulative landscape and visual assessment summarised in **EIA Report Table 6.9.1** of the EIA Report, has determined that the cumulative effects would be not be significant in the consented or application stage scenarios assessed.

27. Since the cumulative assessment within Chapter 6 of the EIA Report was prepared, the cumulative windfarm situation in the 20 km Study Area has changed slightly. The revised cumulative context is shown on **Figure Add2 3**: **Cumulative Windfarm Location Plan (Detailed Area)**.

28. Whilst not assessed in detail in the LVIA, cumulative developments beyond the study area (between 20 km and 45 km) are included in wireframe diagrams to support the approach to cumulative assessment.

1.2.4.2 Existing wind energy developments

29. Existing wind energy developments are a long-established feature of the immediate and upland landscape context within the study area. Operational and under-construction windfarms are assumed to be part of the baseline conditions to which the other scenarios would be added to inform the potential future cumulative wind energy context for the revised proposed Development and the associated cumulative assessment.

30. The Operational Kilgallioch Windfarm lies immediately to the west and north of the revised proposed Development at 580 m from the nearest revised proposed Development turbine. Other operational windfarms within the immediate area include – Airies Farm (2.51 km to the south east); Artfield Fell (2.23 km to the south); Balmurie Fell (2.59 km to the south); and Glenchamber (4.79 km to the south). Arecleoch Windfarm lies 7.65 km to the north, Carscreugh lies 8.29 km to the south, Mark Hill lies 13.24 km to the north and Glen App lies 13.94 km to the west of the proposed Development. Some of these distances have increased due to the removal of T1 and T11 and this has been considered in **Tables 1** and **2**.

1.2.4.3 Consented wind energy scenario

31. In addition to the existing wind energy developments, there is potential for further change to the landscape and visual baseline as a result of consented wind energy developments being built. The 'consented scenario' assumes that all consented stage wind energy developments have become operational and are part of a theoretical baseline situation that also includes the existing and under construction stage windfarms. There are a number of consented windfarms in the study area, the closest of these include Chirmorie 6.10 km to the north and Stranoch 1 6.80 km to the north west of the proposed Development.

32. The only change to the consented wind energy scenario within the 20 km radius detailed area considered in the EAI Report is that the consented development at Chirmorie now has turbines that may be up to 149.9 m tall compared with those considered in the EIA Report which were up to 146.5 m tall. Given that the Chirmorie Variation site is 6.10 km from the Kilgallioch Windfarm Extension Site and is separated from it by Operational Kilgallioch Windfarm this change would have no material bearing on the cumulative effect of the revised proposed Development and is not considered further within this additional information (AI2).

1.2.4.4 Application wind energy scenario

33. **Table 3** contains a list of the application stage windfarm sites included within the revised cumulative assessment.

34. The key changes to the application wind energy scenario are that Artfield Forest and Garvilland have now been submitted as applications.

Wind energy development	No. of turbines	Blade Tip Height (m)	Distance from the revised proposed Development turbines (km)	Local Authority
Arecleoch Extension	14	200	8.80	South Ayrshire
Artfield Forest	12	180	0.62	Dumfries & Galloway
Clauchrie	16	200	16.90	South Ayrshire
Garvilland	5	149.9	7.41	Dumfries & Galloway
Stranoch 2	20	2 x 140 8 x 149.9 10 x 175	6.43	Dumfries & Galloway

Table 3: Application Wind Energy Developments

1.2.5 Updated Cumulative Effects

1.2.5.1 Assessment Tables

35. Where relevant, **Tables 4** to **6** present a revised assessment of potential changes to the cumulative landscape and visual effects assessed for the proposed Development in the EIA Report, as a consequence of the changed cumulative baseline, as a result of the application wind energy stage sites that have arisen within the 20 km Study Area.

36. The tables allow a direct comparison with the cumulative effects presented for the application wind energy scenario within **EIA Report Table 6.9.1**. Notably the lack of application stage windfarm influence as part of the cumulative context at EIA Report stage meant that many of the cumulative magnitudes of change were recorded as negligible or no change as there was limited interaction with these sites.

37. Only those receptors that were assessed in detail have been included in the revised cumulative assessment. It is assessed that the cumulative effects on all other receptors would be **not significant**.

38. **Table 6** presents an updated assessment of the likely cumulative effects from visible aviation lighting at Viewpoint 04 – SUW (West of Derry), Viewpoint 06 - Minor Road near Bennylow (Culvennan Fell), Viewpoint 14 - Bruce's Stone, Glen Trool / Dark Sky Park and Viewpoint 15 – A77 by Cairnpat.

39. The Applicant sent letters to D&GC, dated 23 December 2020 and 18 February 2021, to provide updates on work progressed on the matter of Aviation Lighting since the submission of the application. It should be noted in relation to the aviation lighting assessment that, since submission of the Section 36 application and the letters sent to Dumfries and Galloway Council, the Applicant has investigated, and continues to investigate, the potential for an aircraft detection lighting system (ADLS) that would apply to its relevant projects in South Ayrshire and Dumfries & Galloway. This is recorded in the *Minutes of the Pre-Examination Meeting for Clauchrie (page 3)*. The implementation of an ADLS would mean that the visible aviation lighting would only be switched on when an aircraft entered a specified airspace around the Kilgallioch Windfarm Extension and other windfarms at night. SPR has set out its current position in its *Windfarm Lighting Strategy Paper* dated December 2020, and prepared by Cyrrus Ltd, and has advised the DPEA by letter dated 11 February 2021 that it is willing to accept a condition that requires it to implement an ADLS at Clauchrie Windfarm. Changes which facilitate the implementation of an ADLS are likely to be implemented in whole or part by 2025.

40. The assessment presented in **Table 4** below does not take this ADLS into account but instead assumes a worst visual case that 2,000 candela (cd) or 200cd aviation lights may operate during night-time, as set out in the **EIA Report Appendix 6.2: Visual Assessment of Turbine Lighting**. Furthermore, the updated cumulative assessment assumes that aviation lighting on the hubs of the turbines at Arecleoch Extension, Artfield Forest, Clauchrie and up to ten at Stranoch 2 would also be operating at an equivalent level of illumination and intensity.

41. With an ADLS in place for the revised proposed Development, it is considered that the significant visual effects associated with visible aviation lights that are identified in the EIA Report and this Cumulative Update would be substantially mitigated, as the low incidence of low-level aircraft activity in the area around the Site at night suggests a very infrequent and temporary incidence of visible light from the turbines at night-time.

42. Whilst there are no turbine lights currently operating in the study area for the revised proposed Development, it is recognised that other planned developments within the study area have proposals for visible aviation lighting and that these lights could be seen in conjunction with the proposed lighting for the revised proposed Development. The cumulative effect of the lighting were not assessed in detail in the EIA Report. Following a review of the

cumulative lighting effects it was assessed in **EIA Report Technical Appendix 6.2** at **Section 6.4.6** and reported as follows.

'*On balance, when considering the addition of the proposed Development lighting to a baseline that includes Arecleoch Extension and Clauchrie lights the magnitude of change is considered to be broadly similar to the assessment of the visual effect of the proposed Development turbine lights due to the diminished intensity of the cumulative application scenario lights that would appear in the future baseline. As a result no further increase in effect would occur as a result of this potential cumulative situation'.*

1.2.5.2 Scoping stage wind energy sites

43. There are a relatively large number of scoping stage proposals in the area, as shown on **Figure Add2 3**. Scoping sites closest to the revised proposed Development include Aries II, Arnsheen and Bargrennan which would extend the influence of the existing windfarms in the local area.

44. In accordance with NatureScot guidance (*Assessing the cumulative impact of onshore wind energy developments, March 2012, paragraph 26*), it is not normal practice to include Scoping stage windfarms in cumulative assessments, as they are likely to be subject to substantial change during their design and layout development, which means that the findings of an assessment cannot be attributed any meaningful weight in planning decisions. In respect of some Scoping sites, only basic information is available about their layouts. Scoping sites are normally only included in the cumulative assessment by exception and if agreed with the determining authority/ NatureScot.

45. Scoping stage sites are mapped on **Figure Add2 3** for reference but are not shown on the wirelines or considered further in the detailed cumulative assessment, due to layout and design uncertainties at the pre-application stages.

46. The key change to the cumulative context that would arise, compared with that considered in the EIA Report is the addition of Ballunton and Airies II. There is limited information available for Ballunton other than it is located approximately 15 km to the north-east of the revised proposed Development Site. However, Aries II windfarm has been scoped to include nine turbines at a tip height of up to 200 m.

47. The Airies II site would be located to the west of the existing Airies Windfarm and would link between this and the application stage Artfield Forest which lies immediately to the south of the revised proposed Development. This would increase the scale and geographical extent of the windfarm cluster within the area around the Site to which the revised proposed Development would be added. This change would occur within the same landscape character type as the revised proposed Development - Plateau Moorland with Forest LCT (17a), Glentrool unit but within an area of that unit that is largely managed as coniferous forest plantation. The revised proposed Development would extend the windfarm influence to the north of these sites and immediately to the east of the Operational Kilgallioch Windfarm and across part of an area of open moorland which is part of the characteristics of the Plateau Moorland with Forest LCT which are found across large parts of the landscape further to the west.

48. The larger scale of turbine proposed for the Airies II and Artfield Forest cumulative sites would potentially also have civil aviation lighting so that the introduction of the revised proposed Development lighting would be in addition to this as part of a cluster of lighting and would not be a new feature.

Receptor	Receptor Sensitivity	EIA Report Application wind energy scenario		Revised Application wind energy scenario		
		Cumulative magnitude of change	Significance of Effect	Change from EIA Report assessment due to revised cumulative context and addition of the revised development to this	Cumulative magnitude of change	Significance of Effect
Landscape character effects						
LCT 17a - Plateau Moorland with Forest (Glentrool unit)	Medium	Negligible (localised 2-3km)	Not Significant	Artfield Forest is located within this LCT unit within an area of the unit that is largely managed as coniferous forest plantation. This would increase the scale and geographical extent of the windfarm cluster within the area around the Site (and extending into the adjacent LCT 17 - Plateau Moorland (Balker Moor unit) to which the revised proposed Development would be added. The revised proposed Development would extend the windfarm influence on landscape character to the north of Artfield Forest and immediately to the east of the Operational Kilgallioch Windfarm (also largely within this landscape unit) and across part of an area of open moorland which is part of the characteristics of the Plateau Moorland with Forest LCT which are found across large parts of the landscape further to the west. The size of the revised proposed Development turbines is 180m to blade tip, the same as the twelve proposed Artfield Forest turbines. In this context the larger comparative scale of the revised proposed Development would be less notable.	Medium-Low (localised to the east)	Not Significant
		Negligible (wider area)	Not Significant		Negligible (wider area)	Not Significant
LCT 17 - Plateau Moorland (Balker Moor unit)	Medium- Low	Medium	Not Significant	The influence of the revised proposed Development on this LCT only arises as a result of its visibility as part of a wider context. The Garvilland windfarm is located partly within this unit at a distance of 7.41 km from the revised proposed Development and separated from it by several existing windfarms. Artfield Forest would also be located within the intervening landscape so that the revised proposed Development would be beyond this as perceived from the LCT 17 - Plateau Moorland (Balker Moor unit)	Low	Not Significant
LCT 12 - Drumlin Pasture in Moss and Moor Lowland (Machars unit)	Medium	Negligible	Not Significant	The influence of the revised proposed Development on this LCT only arises as a result of its visibility as part of a wider context. The revised proposed Development would extend the windfarm influence on landscape character to the north of Artfield Forest, immediately to the east of the Operational Kilgallioch Windfarm and to the north-west of the existing Aries windfarm. Its scale would be similar to that of Artfield Forest although it would be seen at a greater distance and beyond it from some parts of this LCT.	Negligible	Not Significant
LCT 18c - Plateau Moorlands with Forestry & Wind Farms	Medium-Low	Low-Medium	Not Significant	The influence of the revised proposed Development on this LCT only arises as a result of its visibility as part of a wider context. The Arecleoch Extension and Clauchrie windfarms are located within this LCT. The revised proposed Development would extend the windfarm influence on landscape character to the north of Artfield Forest, immediately to the east of the Operational Kilgallioch Windfarm and to the north-west of the existing Aries windfarm. Its scale would be similar to that of Artfield Forest although it would be seen at slightly closer proximity and in its foreground from some parts of this LCT. However, this additional windfarm influence would be largely perceived through the intervening Operational Kilgallioch Windfarm from this LCT.	Low	Not Significant

Table 4: Revised assessment of cumulative effects on Landscape Character Types (LCTs)

Viewpoint	Sensitivity	EIA Report Application wind energy scenario		Revised Application wind energy scenario		
		Cumulative magnitude of change	Significance of Effect	Change due to revised cumulative context and addition of the revised development to this	Cumulative magnitude of change	Significance of Effect
Viewpoint 01 - Eldrig Fell	Medium – Low	Negligible	Not Significant	Artfield Forest is the key addition to this view and cumulative context. It would be seen across almost 90 degrees of the field of view at close proximity (1.2 km). Garvilland would also be visible beyond Artfield Forest, Artfield Fell and Glenchamber windfarms. Arecleoch Extension would be largely screened by the intervening landform and Clauchrie would be visible on high ground partially beyond the Operational Kilgallioch Windfarm at a range of over 18 km. The Operational Kilgallioch Windfarm spans a wide extent of the view at relatively close range (2.9 km) along with Artfield fell at 2.4 km with other existing windfarms seen at greater distances beyond and extending the field of view affected by windfarm development. Airies Farm is visible at relatively close range in a different part of the view. The revised proposed Development would extend large scale, close range windfarm development across a further part of the view that is already affected by more distant, smaller scale turbines. It would appear smaller in scale when compared to the closer Artfield Forest but would bring windfarm development closer to the viewpoint across the area of open moorland.	Medium-Low	Not Significant
Viewpoint 02 – SUW (Knockniehourie)	Medium	Negligible	Not Significant	Artfield Forest is the key addition to this view and cumulative context. It would be seen across almost approximately 45 degrees of the field of view at close proximity (1.3 km). It is located across a part of the view where there currently remains open views of the high ground around the Merrick. Garvilland would also be visible at a range of 4.3 km extending the overall horizontal field of view affected by windfarms. Clauchrie is largely screened by the intervening landform. The Operational Kilgallioch Windfarm spans a wide extent of the view at close range (470 m). Other existing windfarms seen at greater distances beyond and extending the field of view affected by windfarm development across a wide field of view. The revised proposed Development would be seen behind the Operational Kilgallioch and Artfield Forest windfarms. The increased distance means that it appears smaller in scale with its main influence being an increase in turbine density, filling in the gaps between the closer turbines. It would extend windfarm development across the more distant area of open moorland.	Low	Not Significant
Viewpoint 03 – SUW (Craig Airie Fell)	Medium	Negligible	Not Significant	Artfield Forest is the key addition to this view and cumulative context. It would be seen at a range of 4.5km and to the fore of the smaller scale and more distant existing windfarms of Artfield Fell, Carscueugh and Glenchamber. All of the other application stage windfarms are located at greater distances and beyond other existing windfarm developments which are visible across a wide part of the view at relatively close proximity. The revised proposed Development would be seen across approximately 30 degrees of the field of view largely in the foreground of Artfield Forest but also extending the windfarm influence further towards Airies Farm. The closer range means that it would appear larger in scale when compared with Artfield Forest, however it would appear much smaller in scale when compared with the very close range turbines of the Operational Kilgallioch Windfarm which are seen in the same general direction. The revised proposed Development would extend windfarm development across an area of open moorland.	Medium-Low	Not Significant
Viewpoint 04 – SUW (West of Derry)	Medium	No Change	No Effect	Artfield Forest is the key addition to this view and cumulative context. It would be seen at a range of 4.8km and to the fore of the smaller scale and more distant existing windfarms of Ballmurie Fell and Artfield Fell. It would be partially hidden by the intervening landform so that in some cases only hubs and blades are visible. No other application stage windfarms would be visible. The revised proposed Development would be seen across approximately 30 degrees of the field of view at a range of 2.9 km. It would be seen largely in the foreground of Artfield Forest but also extending the windfarm influence across the skyline affected by blades of the Operational Kilgallioch Windfarm. The closer range means that it would appear larger in scale when compared with Artfield Forest, however it would appear much smaller in scale when compared with the very close range turbines of the Operational Kilgallioch Windfarm which are seen in other directions. The revised proposed Development would extend windfarm development into an area of open moorland although does not extend into the moorland that forms the immediate context of this viewpoint but is set back beyond the intervening higher ground.	Low	Not Significant

Viewpoint	Sensitivity	EIA Report Application wind energy scenario		Revised Application wind energy scenario		
		Cumulative magnitude of change	Significance of Effect	Change due to revised cumulative context and addition of the revised development to this	Cumulative magnitude of change	Significance of Effect
Viewpoint 06 - Minor Road near Bennylow (Culvennan Fell)	Medium	Low	Not Significant	The application scenario windfarms would add to the density and spread of the windfarms already seen across this view. Artfield Forest is the closest range addition at 6.1 km but would appear smaller in scale when compared with the Aries Farm turbines which spread across a wider extent at closer proximity. The revised proposed Development would be seen across the same part of the view as Aries Farm and Operational Kilgallioch at a greater distance from the viewpoint.	Low	Not Significant
Viewpoint 08 - SUW (Hill of Ochitree)	Medium	Negligible	Not Significant	Artfield Forest is the key addition to this view and cumulative context. It would be seen at a range of 10.3km and to the fore of the smaller scale and more distant existing windfarms of Ballmurie Fell and Artfield Fell. It would appear to create a link between the Operational Kilgallioch and Airies windfarms which are seen at a similar scale and cuts across the small hill of Artfield Fell. Clauchrie would be seen extending windfarm development into a wider part of the view on high ground at a range of 14km relatively close to Mark Hill existing windfarm. The revised proposed Development would be seen across a small part of the horizontal field of view on the skyline to the fore of Operational Kilgallioch but slightly extending across a part of the view affected by the Artfield Forest turbines. Its closer proximity means the revised proposed Development would appear slightly larger in scale than Artfield Forest although it would appear similar in scale to some of the nearby Operational Kilgallioch turbines.	Low	Not Significant
Viewpoint 10 - SUW (Glenwhan Moor)	Medium	Low - Medium	Not Significant	The Garvilland and Stranoch 2 turbines are the most notable addition to the application stage scenario. Artfield Forest would be visible at approximately 10km but partially screened by intervening landform so that only hubs and blades would be visible. The other application stage windfarms would all be seen at greater distances or beyond existing windfarms which are seen across a wide section of this view. The revised proposed Development would be seen across a narrow part of the view spanning across a part of the view that is affected by visibility of the Operational Kilgallioch and Artfield Forest but at a slightly greater distance.	Low	Not Significant
Viewpoint 11 – A714, Bargrennan Cottage	Medium - Low	No Change	No Effect	Artfield Forest is the key addition to this view and cumulative context. It would be seen at a range of 14.1km and to the fore of the smaller scale and more distant existing windfarms of Ballmurie Fell and Artfield Fell. It would appear to create a partial link between the Operational Kilgallioch and Airies windfarms which are seen at a similar scale but to a greater degree on either side. The revised proposed Development would be seen across a narrow part of the view extending the horizontal field of view of windfarm development towards Airies and Artfield Forest so that there would be no apparent gap between the windfarms on this skyline.	Low	Not Significant
Viewpoint 16 – The Merrick	High	Low - Negligible	Not Significant	Clauchrie is the most notable development of the application scenario windfarms in views from the Merrick at a range of 10.5km and appears in a different part of the view to the cluster of windfarms where the revised proposed Development would be located. Artfield Forest is the most notable addition to the immediate cumulative context of the proposed Development. It would be seen at a range of 25.3km and partially to the fore of the smaller scale and more distant existing windfarms of Ballmurie Fell and Artfield Fell. It would appear to create a link between the Operational Kilgallioch and Airies windfarms which are seen at a similar scale but to a greater degree and at closer proximity on either side. The revised proposed Development would be seen across a narrow part of the view in the immediate foreground of Artfield Forest and Kilgallioch and at a similar turbine scale.	Negligible	Not Significant
SUW sequential route assessment	Medium – High (Glen Trool to Bargrennan)	Negligible	Not Significant	Artfield Forest is the key addition to this view and cumulative context. It would be seen at a range of 4.5km and to the fore of the smaller scale and more distant existing windfarms of Artfield Fell, Carscueugh and Glenchamber. All of the other application stage windfarms are located at greater distances and beyond other existing windfarm developments which would be visible across a wide part of the view at relatively close proximity for this section of route. The revised proposed Development would be seen across approximately 30 degrees of the field of view largely in the foreground of Artfield Forest but also extending the windfarm influence further towards Airies Farm. The closer range means that it appears larger in scale when compared with Artfield Forest, however it appears much smaller in scale when compared with the very close range turbines of the Operational Kilgallioch Windfarm which are seen in the	Medium-Low	Not Significant

Viewpoint	Sensitivity	EIA Report Application wind energy scenario		Revised Application wind energy scenario		
		Cumulative magnitude of change	Significance of Effect	Change due to revised cumulative context and addition of the revised development to this	Cumulative magnitude of change	Significance of Effect
				same general direction for parts of this route. The revised proposed Development would extend windfarm development across an area of open moorland.		
	Medium (Bargrennan to New Luce)	Negligible	Not Significant	The Garvilland and Stranoch 2 turbines are the most notable addition to the application stage scenario. Artfield Forest is visible at approximately 10km but partially screened from these sections of this route by intervening landform so that only hubs and blades are visible. The other application stage windfarms would be seen at greater distances or beyond existing windfarms which would appear across a wide section of this view. The revised proposed Development would be seen across a narrow part of the view spanning across a part of the view that is affected by visibility of the Operational Kilgallioch and Artfield Forest but at a slightly greater distance.	Low	Not Significant

Table 5: Revised summary of cumulative effects on viewpoints and visual receptors

Viewpoint	Sensitivity	EIA Report Application wind energy scenario		Revised Application wind energy scenario				
		Cumulative magnitude of change	Significance of Effect	Change due to revised cumulative context and addition of the revised development to this	Cumulative magnitude of change (2000 candela turbine lights)	Significance of Effect (2000 candela turbine lights)	Cumulative magnitude of change (200 candela turbine lights)	Significance of Effect (200 candela turbine lights)
Viewpoint 04 – SUW (West of Derry)	Medium	Not assessed in detail	No further effect.	The lighting of the revised proposed Development would be apparent in the immediate vicinity of the lights of the Artfield Forest turbines. The revised proposed Development would increase the number of lights and the vertical and horizontal field of view affected by lighting but it would not introduce lighting as a new feature of this view.	Low-Medium	Not Significant	Low	Not Significant
Viewpoint 06 - Minor Road near Bennylow (Culvennan Fell)	Medium			The lighting of the revised proposed Development would extend the influence of the lighting seen on the Artfield Forest turbines at closer proximity within this view. The revised proposed Development would increase the number of lights. The more distant Arecleoch and Stranoch 2 lit turbines are unlikely to markedly visible due to intervening landform. The revised proposed Development would not introduce lighting as a new feature of this view.	Medium-Low	Not Significant	Medium-Low	Not Significant
Viewpoint 14 - Bruce's Stone, Glen Trool / Dark Sky Park	High			The lights of the Artfield Forest turbines would be seen just above or above the horizon and extending across a relatively narrow horizontal extent in the centre of this focussed view. The lighting of the revised proposed Development would extend the influence of the lighting seen on the Artfield Forest turbines at closer proximity within this view. The revised proposed Development would increase the number of lights. The revised proposed Development would not introduce lighting as a new feature of this view.	Medium-Low	Not Significant	Low	Not Significant
Viewpoint 15 – A77 by Cairnpat	Medium			The lights of the Artfield Forest turbines would be seen just above or above the horizon and extending across a relatively narrow horizontal extent in the centre of this view. The lighting of the revised proposed Development would occur within the same part of the view and also extend the influence of the lighting seen on the Artfield Forest turbines at a slightly greater distance within this view. The revised proposed Development would increase the number of lights. The revised proposed Development would not introduce lighting as a new feature of this view.	Low	Not Significant	Low	Not Significant

Table 6: Cumulative effects of lighting on viewpoints

1.2.6 Summary of Residual Effects

49. There is a reduction in the landscape and visual impacts when the revised proposed Development is compared with the EIA Report proposed Development that is most notable within the area local to the Site. The removal of T1 and T11 from the proposal also has the effect of increasing the distance to the nearest turbine and reducing the horizontal extents of the windfarm within some views. This is of particular importance where it increases the gap between the revised proposed Development and other existing windfarm developments where they may be of smaller scale. However, the assessment of the effects of the revised proposed Development when added to the baseline context of existing wind energy has found that the reductions in impact would not be sufficient to alter the magnitude of change or the findings of significance assessed in **EIA Report Chapter 6: Landscape and Visual**.

50. A revised cumulative assessment focusses on the alteration to the application stage wind energy development scenario which has altered since the EIA Report was submitted. It assessed some alterations to the magnitude of change but none of these introduce any further significant cumulative effects as a result of the introduction of the revised proposed Development.

51. When the cumulative effect of lighting is assessed, it is found that due to visible aviation lighting that would be located on the application stage Artfield Forest turbine hubs, the introduction of the revised proposed Development would have less of an impact as it would not be introducing lighting within the views but adding to this, often in the immediate vicinity of the Artfield Forest lighting. For instance, at Viewpoint 14 - Bruce's Stone, Glen Trool / Dark Sky Park, the visual effect of lighting is assessed as significant for the 2000cd scenario when the revised proposed Development is added to the baseline night scene, however, when taking into account the changed cumulative context and the introduction of the Artfield Forest turbine lighting, the effect is considered to be **not significant**.

1.3 Hydrology Hydrogeology Geology and Soils

1.3.1 Introduction

52. This chapter assesses the potential impacts of the revised proposed Development layout on hydrology, hydrogeology, geology and soil resources. It supplements **EIA Report Chapter 7: Hydrology, Hydrogeology, Geology and Soils** (December 2019) and should be read in conjunction with it.

1.3.2 Changes to the Assessment

53. The only change to the assessment presented in the EIA Report is in relation to the proposed Development design changes, namely the removal of two turbines and associated access track sections. The removal of these infrastructure elements results in a reduction in the estimated volume of peat to be excavated (and a small reduction in the estimated volume of peat which can be used in site restoration and landscaping).

54. The design also includes one fewer water crossing (WX17), due to the removal of a section of track which would have needed to cross the Monandie Burn to reach the previously proposed T11 location in the south of the Site.

55. There is no change to the baseline information presented in **EIA Report Section 7.5**.

56. There is no change to the mitigation by design and embedded mitigation set out in **EIA Report Section 7.6.1**.

57. The only potential effect identified in the EIA Report, for which the changes to the proposed Development design mean that a change in the magnitude of impact, and therefore significance of effect, merits consideration, is the removal and impact on peat during construction.

58. The potential effect of removal and impact on peat during construction, taking account of embedded mitigation, was assessed as minor adverse (not significant), as noted in **EIA Report Section 7.6.2.2**. The changes to the proposed Development design result in a reduction in the estimated volume of peat to be excavated, from 61,305.2 m^3 presented in **EIA Report Technical Appendix 7.1**, to 56,541.1 m^3 for the revised proposed Development layout. This represents a reduction of approximately 7.8%, resulting from the removal of two turbines from the design, as well as their associated hardstandings and access tracks. There is a corresponding slight reduction (approximately 1%) in the estimated volume of peat that can be reused in site restoration and landscaping.

59. The reduction in volume of peat to be excavated is not considered to materially affect the assessed magnitude of impact (low), and there is no change to the sensitivity of receptor, therefore there is no change in potential effect significance.

60. There is no change to the additional mitigation measures set out in **EIA Report Section 7.7**.

1.3.3 Changes to the Cumulative Assessment

61. The Artfield Forest Windfarm application site is adjacent to the revised proposed Development Site, within the catchment of the Tarf Water, and therefore could in theory give rise to cumulative effects together with the revised proposed Development. However, there is little potential for this to be realised in practice given that, if consented, the construction period for Artfield Forest is very unlikely to overlap with the revised proposed Development, and no significant effects are likely during operation.

62. There is therefore no change to the assessment of cumulative effects. As noted in **Section 7.9** of the EIA Report, no significant residual effects are predicted resulting from the construction or operation of the revised proposed Development in isolation, and there is considered to be **negligible** potential for significant cumulative effects to arise when the operation of other developments in the vicinity is taken into account.

1.3.4 Summary of Residual Effects

63. There is therefore no change to the assessed residual effects as reported in **EIA Report Section 7.8**. Taking account of the mitigation commitments, all residual effects on hydrological, geological and hydrogeological receptors are assessed as being **negligible** or **minor**, and **not significant**.

1.4 Ecology and Biodiversity

1.4.1 Introduction

64. This chapter assesses the potential impacts of the revised proposed Development on non-avian ecology features. It supplements **EIA Report Chapter 8: Ecology and Biodiversity** (December 2019) and should be read in conjunction with it.

1.4.2 Changes to the Assessment

1.4.2.1 Construction

65. Construction effects would be similar to those described within **EIA Report Section 8.6** and include effects on habitats only. However, habitat loss and disturbance would be reduced owing to the smaller footprint of the revised proposed Development. **Table 7** below summarises the effects of the changes between the EIA Report and the revised layouts and effectively replaces **EIA Report Table 8.9**. Scoped-in Important Ecological Features (IEFs) are shown in **bold** highlight in the table.

Phase 1 Habitat	NVC Community or Habitat Types Lost	Total Phase 1 Extent (ha)	Direct Habitat Loss (ha)	Direct Habitat Loss as a % of Phase 1 type	Area of Direct & Indirect Habitat Loss (ha)	% of Direct & Indirect Habitat Loss
A1.2.2 Coniferous woodland – plantation	-	98.82	0.23	0.23	As per direct loss	
A4.2 Felled plantation woodland	-	25.62	0.31	1.20	As per direct loss	

Phase 1 Habitat	NVC Community or Habitat Types Lost	Total Phase 1 Extent (ha)	Direct Habitat Loss (ha)	Direct Habitat Loss as a % of Phase 1 type	Area of Direct & Indirect Habitat Loss (ha)	% of Direct & Indirect Habitat Loss
B1.2 Acid grassland – improved / semi-improved	U4, U6	36.85	0.73	1.99	As per direct loss	
B5 Marsh / marshy grassland	M23, M25	90.58	4.80 (Original application Site layout loss was 5.29)	5.30 (Original application Site layout loss was 5.84)	6.66 (Original application Site layout loss was 7.61)	7.35 (Original application Site layout loss was 8.40)
C1.1 / C1.2 Bracken: continuous / scattered	U20	35.25	1.96 (Original application Site layout loss was 1.98)	5.56 (Original application Site layout loss was 5.62)	As per direct loss	
D2 Wet dwarf shrub heath	M15	1.98	0.03	1.34	0.12	5.85
E1.6.1 **Blanket bog**	**M17, M19**	**58.49**	**0.27**	**0.46**	**1.20**	**2.06**
E1.7 **Wet modified bog**	**M1, M2, M15, M17, M25**	**422.35**	**9.94** **(Original application Site layout loss was 10.49)**	**2.35** **(Original application Site layout loss was 2.48)**	**25.48** **(Original application Site layout loss was 26.88)**	**6.03** **(Original application Site layout loss was 6.36)**
E1.8 Dry modified bog	M19	4.88	0.03 (Original application Site layout loss was 0.17)	0.6 (Original application Site layout loss was 3.50)	0.14 (Original application Site layout loss was 0.61)	2.87 (Original application Site layout loss was 12.45)
E2.1 Flush and spring – acid and neutral	M6	8.28	0.06 (Original application Site layout loss was 0.21)	0.72 (Original application Site layout loss was 2.57)	0.31 (Original application Site layout loss was 0.66)	3.74 (Original application Site layout loss was 7.99)
J4 Bare ground	-	2.86	0.01	0.47	As per direct loss	

Table 7: Estimated loss of habitat from the revised proposed Development infrastructure

66. As can be seen from **Table 7**, there is no change in the assessment for blanket bog. Wet modified bog is the only IEF for which the assessment changes: The direct loss is reduced from 10.49 ha to 9.94 ha and the area of direct and indirect loss is reduced from 26.88 ha to 25.48 ha. This reduction is not considered to significantly alter the conclusion of the adverse effect being Medium and **Significant** under the terms of the EIA Regulations.

67. As described in **EIA Report Section 8.6.4**, no specific mitigation is proposed during construction beyond the standard in-built mitigation and adoption of good practice. However, a **Habitat Management Plan** (HMP) will be implemented during the construction and operation phases that will focus on restoration of wet modified bog through the blocking of drains in areas where historical drainage channels are more concentrated. Because of this, effects on wet modified bog will be **low beneficial** and **not Significant** under the terms of the EIA Regulations

1.4.2.2 Operation

68. As described in **EIA Report Section 8.6.7**, all likely direct and indirect effects on wet modified bog and blanket mire have also been considered in the construction effects section. Indirect habitat losses from drying of peat will commence when drains are first installed during the construction phase and then continue during the operation phase; the moment when vegetation change and drying impacts may become measurable is difficult to predict but may be delayed and therefore not occur until the operational phase. However, for completeness and ease of assessing impacts, they are considered together in the construction effects section. No further negative impacts on wet modified bog and blanket mire are predicted during the operational phase. However, an improvement is predicted in the quality of wet modified bog within the proposed HMP Units.

1.4.3 Changes to the Cumulative Assessment

69. The predicted in-isolation effects are considered to have no potential to contribute to cumulative effects. The cumulative assessment within **EIA Report Section 8.7** remains unchanged, which identified cumulative effects as **not significant**.

1.4.4 Summary of Residual Effects

70. The revised proposed Development, particularly the reduction in land-take, will result in a minor reduction in the magnitude of effects on habitats, including an IEF, wet modified bog. However, the assessment of significance of effects remains unchanged from that outlined within the EIA Report, which concluded that there will be no significant effects in terms of the EIA Regulations.

71. This update has not altered the overall conclusions of Chapter 8 of the EIA Report, which is **no significant residual effects** on non-avian ecology and biodiversity.

1.5 Ornithology

1.5.1 Introduction

72. This chapter assesses the potential impacts of the revised proposed Development on birds. It supplements **EIA Report Chapter 9: Ornithology** (SPR, December 2019) and should be read in conjunction with it.

1.5.2 Changes to the Assessment

1.5.2.1 Construction

73. Construction effects would be similar to those described within **EIA Report Section 9.6**. The extent of the windfarm is reduced, which in turn would reduce the scale and magnitude of spatial effects. As such, the impacts identified within the EIA Report remain unchanged; no significant effects would occur on sensitive ornithological receptors as a result of the revised proposed Development.

1.5.2.2 Operation

74. Most of the operational effects identified within EIA Report Section 9.6 would remain unchanged; the exception to this is collision risk which would be altered due to the reduction in turbine number. As a result, collision risk modelling (CRM), using the same methodology as outlined in the **EIA Report Appendix 9.2**, has been re-run. Detailed calculations are presented in **AI2 Appendix 1: Revised Collision Risk Modelling**.

75. **Table 8** shows the results of the re-run CRM. Estimated collision risk has decreased from the estimates provided in the EIA Report for wintering hen harrier due to the fact that there are fewer turbines and a reduction in the size of the turbine envelope.

Species	Revised proposed Development		Proposed Development (**2019 EIA Report)**	
	Estimated collision per year	Number of years per collision	Estimated collision per year	Number of years per collision
Hen harrier	0.004	233	0.005	186

Table 8: Collision Risk Estimate

76. The decrease in predicted hen harrier collisions does not change the assessment, including cumulative assessment, as presented in the EIA Report. As such, the identified collision risk remains a **not significant** effect.

1.5.3 Changes to the Cumulative Assessment

77. The predicted in-isolation effects are considered to have no potential to contribute to cumulative effects. The cumulative assessment within **EIA Report Section 9.7** remains unchanged, which identified cumulative effects as **not significant**.

1.5.4 Summary of Residual Effects

78. The revised CRM undertaken has not resulted in any changes to the overall assessment findings, which remain not significant. The revised proposed Development, particularly the reduction in number of turbines from 11 to 9 and the reduction in land-take, will result in a minor reduction in the magnitude of effects on ornithological receptors overall. The assessment of significance of effects remains unchanged from that outlined within the EIA Report, which concluded that there will be no significant effects in terms of the EIA Regulations.

79. This section updates the Ornithology assessment within the EIA Report. This update has not altered the overall conclusions of the EIA Report, which is **no significant residual effects** on birds.

1.6 Noise

1.6.1 Introduction

80. This chapter assesses the potential impacts of the revised proposed Development on noise sensitive receptors surrounding the Site. As with **EIA Report Chapter 10: Noise**, the levels of noise likely to occur at local residential properties as a result of the operation of the revised proposed Development have been assessed in respect of the revised proposed Development in isolation, and cumulatively with other local windfarm developments. Potential noise effects from construction activities and any borrow pit workings have been assessed in **EIA Report Chapter 10**. There are no anticipated changes to the construction noise as part of the revised proposed Development.

1.6.2 Changes to the Assessment

81. As set out in Section 1.1.1 above, T1 and T11 have been removed from the proposed Development layout and therefore, when operating in isolation, the revised proposed Development produces lower noise levels than predicted in **EIA Report Chapter 10: Noise**. The results are also shown as noise contours on **Figure Add2 4** which also shows the locations of the assessed noise receptors.

1.6.3 Changes to the Cumulative Assessment

82. Since the application and the EIA Report were submitted in December 2019, there have been some changes regarding the planning status of other proposed windfarm sites in the area. In March 2021, a planning application was submitted to Dumfries and Galloway Council for the erection of five wind turbines forming the proposed Garvilland Windfarm, and an application was made to the Energy Consents Unit for the erection of up to 12 wind turbines forming the Artfield Forest Windfarm.

83. Both the Garvilland and Artfield Forest windfarms are situated to the south of the revised proposed Development. Artfield Forest is immediately adjacent to the south of the revised proposed Development Site with the two closest turbines from the proposed sites being around 0.62 km apart. Garvilland is more distant and just on the border of what could be considered relevant in terms of cumulative noise impact, with the closest two turbines from the proposed sites being around 7.41 km apart.

84. **EIA Report Chapter 10** stated that detailed cumulative noise predictions are not necessary since the proposed 30 dB L_{A90} limit '*ensures that even if operational noise from other windfarm developments resulted in noise at receptor locations at 40 dB L_{A90}, the addition of the proposed Development would not add significantly to overall noise levels*'. Whilst this is still the case, it is noted that Artfield Forest Windfarm is very close to the revised proposed Development and indicative cumulative noise predictions have therefore been prepared. Details of the location, hub height, and model of all turbines included in the predictions are supplied at **AI2 Appendix 2** along with the assumed sound power levels for each turbine type. Predictions have been carried out in line with the methodology specified within **EIA Report Chapter 10**.

85. In addition to the updated noise predictions, it should be noted that some errors were found in the '*distance to nearest turbine*' column of the **EIA Report Table 10.6.1** and these have now been corrected. **Table 9** below presents an update to **EIA Report Table 10.6.1**.

Location Name	Easting	Northing	Distance to Nearest Turbine (km)	Predicted Noise Level (dB L_{A90})	Margin to 30 dB L_{A90} limit (dB)
High Eldrig[1]	224984	569177	1.0	-	-
Low Airies	226131	566535	3.8	24	6
Artfield	223682	566123	3.7	25	5
Quarter Farm	218645	568273	4.6	22	8
Glewhilly	217237	571345	5.7	19	11
Dirniemow	217448	570847	5.5	20	10
Pultadie	218253	570027	4.7	22	8
Miltonise	218968	573422	4.9	21	9
Derry	226063	573413	3.0	27	3
Tannielaggie	228748	572073	4.3	23	8
Darloskine Bridge	227995	572901	4.0	23	7
Waterside	229434	571817	4.8	21	9
Urrall	229268	569560	4.5	22	8
Kilquhockadale	229256	567802	5.1	20	10
The Old Schoolhouse	228680	566394	5.5	20	10
Polbae	227923	572984	4.0	23	7
Balminnoch Cottage	226843	565396	5.1	21	9
Kilmacfadzean	220363	567523	3.5	25	5

Table 9: Predicted Proposed Development Noise Levels, dB L_{A90}

86. **Table 10** below presents indicative (worst-case downwind in all directions) cumulative noise predictions in the context of the individual contribution from the revised proposed Development at each noise sensitive receptor. The predictions demonstrate that, for the worst-affected locations, where cumulative noise from other windfarm sites is

[1] High Eldrig is a derelict property and therefore does not require assessment, but its location is shown as it was considered as a potential noise sensitive receptor.

above 40 dB L_{A90}, the revised proposed Development generates levels of noise which are at least 19 dB below the cumulative noise from other sites. For all other locations, the revised proposed Development is still at least 11 dB below the noise generated by other wind energy sites and would not significantly affect the overall cumulative noise level in combination with the other sites considered in these noise predictions.

Location Name	Predicted Noise Level (dB L_{A90})		Margin to Cumulative
	Revised Proposed Development	Other existing or proposed windfarms (Cumulative)	(dB)
Low Airies	24	43	19
Artfield	25	44	19
Quarter Farm	22	38	16
Glewhilly	19	41	22
Dirniemow	20	41	21
Pultadie	22	41	19
Miltonise	21	44	22
Derry	27	47	21
Tannielaggie	23	33	11
Darloskine Bridge	23	35	12
Waterside	21	32	11
Urrall	22	34	13
Kilquhockadale	20	36	16
The Old Schoolhouse	20	37	17
Polbae	23	36	12
Balminnoch Cottage	21	37	16
Kilmacfadzean	25	39	15

Table 10: Predicted Cumulative Noise Levels, dB L_{A90}

1.6.4 Summary of Residual Effects

87. This section updates the noise assessment within the EIA Report, taking into consideration the reduced noise output related to fewer turbines and additional cumulative windfarm sites. This update has not altered the overall conclusions of the EIA Report, which is **no significant residual effects** predicted at any noise sensitive receptors.

1.7 Cultural Heritage

1.7.1 Introduction

88. This chapter assesses the potential impacts of the revised proposed Development on cultural heritage assets. It supplements **EIA Report Chapter 11: Cultural Heritage** (December 2019) and should be read in conjunction with it.

1.7.2 Changes to the Assessment

89. As described in **AI2 Chapter 4: Development Description**, the revised proposed Development will comprise nine turbines, through the removal of two turbines (T1 and T11) from the proposed Development. Turbines T1 and T11 were removed following consultation with HES, a change that was designed to reduce the visual impact on the Scheduled Monument (SM): Wood Cairn, cairn, Eldrig Fell (SM 1953).

90. The removal of Turbines T1 and T11 also results in a slight, but beneficial, reduction to the impact of the proposed Development on the setting of the scheduled monument: Wood Cairn, cairn, Eldrig Fell (SM 1953). In the **EIA Report Section 11.6.2.1**, the nearest proposed turbine (T11) would have been 910 m from the cairn on the summit of Eldrig Fell and all 11 turbines would have been visible in views to the northwest of the cairn (**EIA Report Figure 6.15a-g; LVIA VP 1**). The revised proposed Development means that the closest proposed turbine (T9) would now be 1.45 km from the cairn, an increase in the stand-off of 540 m. The removal of T11 and associated access track also reduces the impact on the setting of Wood Cairn by removing a turbine that was originally sited between the cairn and a group of related and associated monuments along the Monandie Burn (two other funerary monuments (5 and 6), and four burnt mounds (10, 11, 22 and 23), described in **EIA Report Section 11.5.1.1**. The removal of T11 thereby results in retention of an uninterrupted visual link between the cairn and this group of monuments that are a feature of its setting.

91. A revised photomontage visualisation from Eldrig Fell (**Figure Add2 6.15h; LVIA VP 01**) shows the effect of the change to the revised layout compared with that of the original, as it affects the setting of Wood Cairn. Turbines T1 and T11, previously standing close to the cairn and visually prominent in the view, are removed. Views in other directions from the cairn would remain unaffected by the revised proposed Development. These views already include operational windfarm developments: notably Airies Windfarm, to the southeast, and Glenchamber, Artfield Fell and Balmurrie windfarms to the southwest.

92. The introduction of the revised proposed Development would change the baseline setting of Wood Cairn by introducing additional wind turbines into the view to the northwest and would still noticeably alter the way in which the cairn and its setting are experienced and appreciated, as a result of the additional turbines between the cairn and the Operational Kilgallioch Windfarm (**Figure Add2 6.15; LVIA VP 01**). The integrity of the hilltop setting of the cairn would be retained, and the visual link between the cairn and associated monuments around the Monandie Burn would remain uninterrupted as a result of the changes to the proposed Development layout. It would remain possible for any visitor to Wood Cairn to understand the cairn as a funerary monument set in a prominent topographic position and to read the integrity of the wider landscape setting and the cairn's relationship with the surrounding landscape, and with potentially contemporary monuments within it..

93. Overall, and taking account of the changes to the proposed Development layout, it is assessed that the change to the baseline setting of Wood Cairn from the revised proposed Development would be of low magnitude and the effect, on an asset of high sensitivity, is assessed as being of **moderate** significance (**significant** in EIA terms)..

1.7.3 Changes to the Cumulative Assessment

94. There is one key change to the cumulative assessment that is applicable to this revised cultural heritage assessment: a planning application for a 12 turbine (180 m to tip) development (Artfield Forest), directly to the south of the revised proposed Development. At the time of the EIA Report assessment (2019), this scheme was not included in the cumulative assessment. There is also another proposed development (Airies II), currently at the scoping stage, that would interpose between Wood Cairn and Artfield Forest if that development was to be brought forward as a future planning application. There is currently no certainty over the disposition of the proposed Airies II turbines and it is therefore not included in the cumulative assessment here.

95. The cultural heritage assessment in the *EIA Report* (*Chapter 6*) for Artfield Forest (*ECU reference: ECU00003245*) has determined that there would be an adverse impact of Moderate significance on the setting of Wood Cairn from the Artfield Forest development. The closest of the proposed Artfield Forest turbines would be 1.1 km to the south of Wood Cairn and, as shown by the arrangement on **Figure Add2 7**, would add additional turbines around the cairn in views to the south, being viewed as extending the visibility of turbines southeast from the Operational Kilgallioch Windfarm, and interposing additional turbines between the cairn and existing turbines at Artfield Fell and Balmurrie Fell windfarms (**Figure Add2 6.15e; LVIA VP 01**).

96. Introducing Artfield Forest Windfarm into the cumulative scenario would lead to some addition to the encirclement of Wood Cairn by wind turbines through in-filling of the existing gaps between the Operational Kilgallioch Windfarm and Artfield Fell Windfarm. The closest of the Artfield Forest turbines would be closer to Wood cairn than would T9 of the revised proposed Development (1.1 km as opposed to 1.45 km) but the ability of any visitor to understand and appreciate the prominent hilltop setting of the cairn and the expansive landscape views obtainable from the cairn would not be unduly compromised as wind turbines are already a feature of the surrounding landscape.

97. Overall, the addition of the revised proposed Development to a baseline scenario including Artfield Forest Windfarm would elevate the magnitude of impact on the setting of Wood Cairn from low (for the revised proposed Development alone) to medium, as a result of the cumulative encroachment of turbines into its setting. Applying the assessment matrix (**EIA Report Table 11.4.3**) and based on professional judgement this would result in a combined impact on the setting of Wood Cairn of **moderate** significance (**significant** in EIA terms) but would not give rise to any diminishment of the character and cultural significance of the cairn as a funerary monument in a prominent hilltop setting, with wide ranging views all-round and widely visible from its surroundings. The contribution to the combined effect from the revised proposed Development would be no greater than that of the revised proposed Development alone: that is, one of low magnitude and **moderate** significance.

1.7.4 Summary of Residual Effects

98. This section updates the 2019 assessment within the EIA Report, taking into consideration the proposed amendments to the original layout: the removal of two turbines (T1 and T11).

99. The revised proposed Development would not alter the findings of residual construction effects presented in the **EIA Report Section 11.8.1**. Taking the proposed mitigation (**EIA Report Section 11.7**) into account, any residual effect arising from construction of the revised proposed Development in relation to direct effects on cultural heritage assets within the Site would be of no more than **minor** significance (**not significant** in EIA terms).

100. The revised proposed Development would not alter the findings of residual operational effects presented in the **EIA Report Section 11.8.2**. During its operational lifetime, the residual effects of the revised proposed Development on the settings of heritage assets in the Outer Study Area would be the same as the predicted effects. Effects on the settings of heritage assets are long-term and cannot be reduced by any form of mitigation other than avoidance or reduction

101. A residual effect of **major** significance (significant in EIA terms) is predicted, on the setting of the collective heritage assets within the Site that are collectively assessed as comprising a historic landscape. A residual effect of **moderate** significance (significant in EIA terms) is predicted, on the setting of one Scheduled Monument: Wood Cairn, cairn, Eldrig Fell (SM 1953).

1.8 Access, Traffic and Transport

1.8.1 Introduction

102. This chapter assesses the potential impacts of the revised proposed Development on traffic and transport. It supplements **Chapter 12: Access, Traffic and Transport** of the EIA Report (December 2019) and should be read in conjunction with it.

1.8.2 Changes to the Assessment

103. The removal of two turbines,T1 and T11, and associated infrastructure will result in a slight decrease in the number of vehicle trips during the construction phase of the revised proposed Development, but this will not materially change the findings of the Transport Assessment provided within **EIA Report Section 12.6** and **Appendix 12.1**. This concluded **slight** adverse effects, **not significant** in terms of the EIA Regulations.

1.8.3 Changes to the Cumulative Assessment

104. A detailed cumulative assessment on transport has not been updated as no new committed developments (sites that have consent / permissions secured) are now included in the cumulative baseline.

105. Any effects from wind energy developments being constructed within the same timescales would be mitigated through the use of an overarching Traffic Management and Monitoring Plan for all sites and by implementing a phased delivery plan which would be agreed with the local council roads department and Police Scotland.

1.8.4 Summary of Residual Effects

106. The update to the proposed Development layout has not altered the overall conclusions of the EIA Report, which found **no significant** residual effects in respect to traffic and transport issues.

1.9 Socio-economics Tourism and Recreation

1.9.1 Introduction

107. This section updates the socio-economics, tourism and recreation assessment within **EIA Report Chapter 13**, taking into consideration the changes to the strategic context and the reduction in the number of turbines (AI2) and removal of the solar component (AI1) of the proposed Development, and should be read in conjunction with it.

1.9.2 Changes to the Assessment

1.9.2.1 Strategic Context

108. Since the EIA Report was published (2019), the socio-economic policy context has changed due to the adverse economic impact of the Covid-19 pandemic and a focus on green jobs in the economic recovery strategy.

109. The role that renewable energy can play in economic recovery was recognised in the June 2020 report of the *Advisory Group on Economic Recovery* (AGER) (Advisory Group on Economic Recovery, 2020) to the Scottish Government. The recommendations included "*prioritisation and delivery of green investments*" and "*ensure the recovery does not 'lock-in' greenhouse gas emissions or increased climate risk*".

110. The Scottish Government's response to the AGER report, the *Economic Recovery Implementation Plan* (Scottish Government, 2020), set out how it intends to take forward the report's recommendations. It prioritises a sustainable economic recovery that supports all parts of Scotland, while meeting its climate change targets and wider environmental objectives.

111. The *South of Scotland Regional Economic Partnership's (REP) Draft Regional Economic Strategy* (South of Scotland REP, 2021) sets out a vision of the South of Scotland (Dumfries and Galloway and the Scottish Borders), including the vision to be a region "*where natural capital propels green growth*". A key theme is a "*green and sustainable economy*", with a particular focus on seizing the opportunity of the transition to net zero, as well as supporting community wealth building and growing regional supply chains.

112. In its *Strategic Economic Plan*, South Ayrshire Council (South Ayrshire Council, 2020) sets out the opportunity to develop a more robust economy following Covid-19. This includes a more sustainable, less carbon intensive and higher productivity future.

113. Since the Covid-19 pandemic, the renewable energy sector has increased in importance in national, regional and local economy strategy, through the recognition of the pivotal role the sector can play in economic recovery and transformation.

1.9.2.2 Construction

114. The economic impact associated with the revised proposed Development's construction will depend on the number and capacity of turbines. This assessment has been based on nine turbines with a combined capacity of around 50 MW. Using the methodology outlined in the **EIA Report Section 13.4**, a development of this capacity would be expected to have a capital cost of £58.0 million.

115. Using the same approach and assumptions about the share of contracts secured by each study as outlined in the **EIA Report Section 13.6**, it was estimated that the economic impact associated with this expenditure would be £3.3 million GVA and 49 job years in Dumfries and Galloway and South Ayrshire, and £15.3 million GVA and 237 job years in Scotland.

116. The number of turbines and overall capacity has been reduced, which means that the overall economic impact has reduced proportionally. However, the magnitude of economic impact in each of the study areas is similar, and therefore the effect has been assessed as the same as within the **EIA Report Section 13.6, negligible** to **minor beneficial** and **not significant**.

1.9.2.3 Operation

117. As with the construction impact, the operational impacts are assessed using the same methodology as outlined in the **EIA Report Section 13.6** and are based on the number and capacity of turbines. It was estimated that the annual economic impact associated with operation and maintenance at the proposed Development would be £0.3 million Gross Value Added (GVA) and 5 jobs in Dumfries and Galloway and South Ayrshire, and £0.5 million GVA and 8 jobs in Scotland.

118. The number of turbines and overall capacity has been reduced, which means that the overall economic impact has reduced proportionally. However, the magnitude of economic impact in each of the study areas is similar, and therefore the effect has been assessed as the same as within the EIA Report, **negligible beneficial** and **not significant**.

1.9.2.4 Wider Benefits

119. The potential community benefit fund associated with the revised proposed Development would be expected to be reduced in proportion to the number of turbines (a reduction from 11 to 9) and therefore a reduction in MW installed, from which the community benefit is calculated.

120. The non-domestic rates have been estimated based on the valuations of other windfarms, as in the EIA Report. It is recognised that these comparator projects qualified for Renewable Obligations support, which has the effect of increasing revenues and valuations, compared to a windfarm which does not qualify. The Renewable Obligations scheme is no longer in operation and so a different approach to valuation could be taken in future. The figures provided are estimates based on other windfarms and the actual rates paid will depend on the decision of the assessors and future poundage rates. It was assumed that there would be an annual contribution of £0.6 million annually. The overall assessed significance (negligible beneficial) remains the same.

1.9.2.5 Tourism and Recreation

121. For tourism and recreation effects, there is no change to the assessment presented within the EIA Report, **negligible** and **not significant**.

1.9.3 Changes to the Cumulative Assessment

122. It is not anticipated that there will be any change to the cumulative impacts associated with the revised proposed Development.

1.9.4 Summary of Residual Effects

123. The residual effects identified in the previous assessment include:

- a temporary, Minor beneficial effect on the regional economy, as a result of construction related expenditure;
- a temporary, Negligible beneficial effect on the national economy as a result of construction related expenditure;
- a temporary, Negligible effect on local access to the Southern Upland Way;
- a permanent Negligible beneficial effect on the regional and national economy due to operations and maintenance expenditure; and
- a permanent, Negligible effect on local tourism assets, accommodation providers and trails from the operation of the proposed Development.

124. This updated assessment has not altered the overall conclusions of the EIA Report, which is **no significant residual effects** on socio-economics, tourism and recreation.

1.10 Other Issues

1.10.1 Introduction

125. This chapter assesses the potential impacts of the revised proposed Development on:

- aviation;
- climate and carbon balance;
- land use and forestry; and
- telecommunications.

126. The Glint and Glare section is no longer applicable due to the removal of the previously proposed solar array from the proposed Development layout, as set out in the additional information (AI1) submitted earlier in 2021.

1.10.1.1 Aviation

127. Through both consultation and assessment, as presented in **EIA Report Chapter 14**, it was concluded that the proposed Development will have no effect on aviation infrastructure, from either physical obstruction or radar interference. It is not anticipated that there would be any changes to this (**EIA Report Section 14.2**) from the removal of two turbines from the proposed Development.

1.10.1.2 Climate and Carbon Balance

128. An updated carbon calculator assessment has been undertaken, with input parameters for the Scottish Government online calculation tool being updated to account for the removal of two turbines and their associated infrastructure. A summary of the anticipated carbon emissions and carbon payback period of the revised proposed Development are provided in **Table 11** below.

Results	Expected	Minimum	Maximum
Net emissions of carbon dioxide (t CO_2 eq.)	141,249	110,694	162,489
Carbon Payback Period of proposed Development Comparison			
Displacing Coal-fired electricity generation (years)	1.3	0.9	1.7
Displacing Grid-mix of electricity generation (years)	4.7	3.4	6.1
Displacing Fossil fuel - mix of electricity generation (years)	2.7	1.9	3.4

Table 11: Anticipated Carbon Emissions

129. The calculations of total CO_2 emission savings and payback time for the revised proposed Development indicates the overall payback period of a windfarm with 9 turbines with an average (expected) installed capacity of 5.6 MW per turbine would be approximately 2.7 years (previously 2.6 years), when compared to the fossil fuel mix (the existing energy mix within the UK) of electricity generation (online calculation tool project reference Z2Z8-L2V4-MSVSv1).

130. The Site would in effect be in a net gain situation following this time period and will then be contributing to national objectives of reducing greenhouse gas emissions and meeting the 'net zero' carbon targets by 2050, therefore the revised proposed Development is evaluated to have an overall beneficial effect on climate change mitigation.

1.10.1.3 Land Use and Forestry

131. The amendments to the proposed Development will not result in any change to the predicted direct impacts on forestry, as assessed in **EIA Report Section 14.5**. Therefore, the findings presented within the EIA Report remain unchanged.

132. As a result of the removal of two turbines, the revised proposed Development's infrastructure footprint has decreased from 19.97 ha to 18.62 ha. The small reduction in the area of agricultural land lost of 1.35 ha does not change the findings from the EIA Report, no effect on agricultural land capacity within Dumfries and Galloway as a whole or the long-term land use of the Site.

1.10.1.4 Telecommunications

133. No fixed telecommunication links are located within 2 km of the Site and no concerns were raised by consultees. The revised proposed Development will therefore have no effect on any telecommunication interests, as presented **in EIA Report Section 14.6**. No changes to this assessment are required as a result of the removal of two turbines.

1.10.2 Summary of Residual Effects

134. This updated section has not altered the overall conclusions of the EIA Report, which is **no significant residual effects** on aviation, climate and carbon balance, land use and forestry and telecommunications.

1.11 Schedule of Commitments

135. The schedule of mitigation remains unchanged from the **EIA Report Chapter 15: Schedule of Commitments** (December 2019)

1.12 Summary

136. This Technical Update Report provides an update to the technical assessments included within the EIA Report submitted with the application in December 2019 as a result of changes made to the proposed Development layout following consultation with HES.

137. The various updated technical assessments within the sections above have concluded that although there may have been some changes in the magnitude of the impacts expected (mostly reduced) the overall conclusions of the EIA Report and the potential for significant effects remain as previously reported. These are provided within **EIA Report Chapter 16: Summary of Residual Effects**.

138. The exception to the table referenced above is the contribution to the combined effect from the revised proposed Development and new the new cumulative baseline on the setting of the historic landscape, containing a group of historic farmsteads and prehistoric remains. Where, there would be no greater effect than that of the amended proposed Development alone: that is, one of low magnitude and **moderate** significance, previously noted as major.

1.13 References

Advisory Group on Economic Recovery (2020), *Towards a Robust Resilient Wellbeing Economy for Scotland.*

South of Scotland Regional Economic Partnership (2021), *South of Scotland: Draft Regional Economic Strategy*.

Scottish Government. (2020*), Economic Recovery Implementation Plan*.

South Ayrshire Council (2020), *South Ayrshire Strategic Economic Plan: Vision 2030*

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