Kirkan Wind Farm Ltd

Kirkan Onshore Wind Farm

Supplementary Environmental Information

661694

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RSK GENERAL NOTES

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PREFACE

This is a supplementary environmental information (SEI) report to the Environmental Statement for the proposed Kirkan Wind Farm, hereafter referred to as "the proposed development"), located approximately 5.8 km northwest of Garve, Highlands, on the southern side of the A835 trunk road southeast of Loch Glascarnoch dam. The Environmental Impact Assessment Report (EIA report) accompanied the application for deemed planning consent under Section 36 of the Electricity Act 1989, as submitted to the Scottish Government's Energy Consents & Deployment Unit in March 2019. This report includes the SEI required to be submitted following receipt of consultation responses and discussions with statutory consultees regarding the proposed development. It contains supplementary detailed hydrological and peat assessments requested by the Scottish Environment Protection Agency (SEPA) and supplementary landscape assessments requested by The Highland Council and Scottish Natural Heritage. A copy of the SEI report, has been deposited at each of the locations indicated below and will be available for inspection until at least 1st December 2019 during normal opening hours.

The Highland Council Offices

County Buildings

Dingwall

IV15 9QN

Garve Village Hall

Station Road

Garve

IV23 2PP

Hard copies of the SEI report are available subject to a charge of £100 (plus P&P). Hard copies of the non-technical summary are available free of charge. A digital version of the SEI report on CD-ROM can be obtained for a fee of £10. Copies available on written request from:

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4th Floor, 5 Atlantic Quay

150 Broomielaw

Glasgow

G2 8LU

Email: representations@gov.scot

Via website: www.energyconsents.scot/Register.aspx

Expressions will be accepted up to 1st December 2019.

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1 INTRODUCTION

Background

1.1 This report contains supplementary environmental information (SEI) to the Environmental Impact Assessment Report (EIA Report) for the proposed Kirkan Wind Farm (hereafter referred to as "the proposed development"). The proposed development is located approximately 5.8 km northwest of Garve, Highlands, on the southern side of the A835 trunk road southeast of Loch Glascarnoch dam. The EIA Report accompanied the application for deemed planning consent under Section 36 of the Electricity Act 1989, as submitted to the Scottish Government's Energy Consents & Deployment Unit in March 2019.

1.2 The SEI is required as a result of consultation responses to the proposed development from the Scottish Environment Protection Agency (SEPA) in relation to revised hydrological and peat assessments and The Highland Council and Scottish Natural Heritage regarding supplementary landscape assessments.

1.3 Specifically, the SEI includes the revised Hydrological and Peat Assessment, a night time assessment from Wild Land Areas (WLAs) 28 and 29 and a cumulative assessment with Lochluichart windfarm extension. The SEI includes a revision of the access track layout for the proposed development in response to comments from SEPA on the layout proposed within the EIA Report. The proposed new layout is shown in Figure 1.1. A comparison of the layout proposed in this SEI report in comparison with that proposed in the EIA Report (March 2019) is shown in Figure 1.2. The SEI report also includes a summary assessment from the other environmental specialists involved in the EIA on the implications of the revision for their respective disciplines, namely: archaeology and cultural heritage; ecology; ornithology; noise and vibration; traffic and transportation; aviation, radar and telecoms; and climate change.

1.4 A separate Planning Statement Update is to be submitted in conjunction with this SEI Report covering an update to relevant planning matters which have arisen since the submission of the application and/or which may arise from the submission of the SEI.

Environmental impact assessment (EIA) process

1.5 The publication of this SEI Report will be advertised in accordance with Regulation 20 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. A copy of the SEI Report will also be sent to key consultative bodies in receipt of a copy of the original EIA Report, and a copy will be displayed in two public locations that a copy of the EIA Report was displayed.

Structure of the SEI report

1.6 The SEI Report is presented in two sections:

- Chapter 2: Hydrology and Peat
    - Appendix 1: Hydrology and Peat Figures

- Chapter 3: Landscape and Visual Impact
    - Appendix 2: Landscape & Visual Impact Figures
- Chapter 4: Concluding remarks

1.7 Further commentary is also provided with respect to any additional mitigation measures/environmental commitments recommended within the assessments of this SEI report.

EIA team

1.8 The relevant expertise and qualifications of the technical specialists involved in Chapters 2 and 3 of this SEI report are detailed in Table 1-1 below.

Table 1-1 Technical Specialists

Name	Qualifications	Company	Role and expertise
Catherine Isherwood	MA, MSci, MSc, PhD	RSK	Technical lead – Hydrology, Geology and Peat Chartered Geologist, Fellow of the Geological Society of London, Professional Graduate of the Institute of Materials, Minerals and Mining
Bob Bainsfair	BLA, BA (Hons) CMLI	Ramboll Environ	Technical Lead - Landscape

All other technical specialists remain the same as described in the EIAR submitted in March 2019.

2 HYDROLOGY AND PEAT

Background

2.1 The EIA Report for Kirkan Wind Farm was submitted in March 2019. Following submission, the Applicant received feedback from a number of consultees regarding the content and findings of the assessments. This section of the report relates to consultee responses concerning Chapter 8 (Hydrology) and Chapter 9 (Geology, Hydrogeology and Soils) of the EIA Report and the technical appendices produced in support of those chapters.

2.2 The principal concerns raised were in relation to peat, mostly relating to the estimated volumes of peat that would require excavation to allow wind farm construction to go ahead. Some minor redesign has allowed revised peat estimates to be produced, but have also necessitated updates to associated assessments to take account of the changes.

Revised Assessments

2.3 Following feedback and discussion with consultees, revisions have been undertaken to a number of assessments provided in support of the EIA Report chapters covering Hydrology and Geology, Hydrogeology and Peat. The sections below provide relevant detail on the key changes, with details of previous assessments for comparison where this is important.

Floating roads and peat

2.4 Through post submission consultations, SEPA requested that use of floating track should be considered, to help minimise the volume of peat that would require excavation.

2.5 There are three main factors that need to be taken into consideration during the process for identifying sections of track that may be suitable for floating track construction. These are:

- the length of the track section over deep peat;
- the ground slope; and
- the design cut-off depth to be used when considering the suitability of floating track.

2.6 In track construction, a transition is required from standard cut track into a section of floating track, in order to provide stability of construction, continuity and suitable anchoring of the geogrid used in floating track construction. The guidance document *'Floating Roads on Peat'* (FCE & SNH, 2010) indicates that the transition section is usually between 30 and 70 m in length and would be required at both ends of the floated section of track. The length required varies depending on local ground conditions and the exact construction technique used. This requirement for a transition usually means that a minimum length of floating track of 100 m is necessary for the change in construction method to be considered, and sections of 150 m or greater are usually preferred.

2.7 Floating track on sloping ground brings another set of considerations, as it is impossible to avoid differential loading on the substrate when a natural gradient is present. This, in turn, can lead to induced instability and should therefore be treated with caution. FCE & SNH (2010) states that:

> *"It is not usual to construct floating roads on slopes greater than 5%."*

2.8 A grade of 5% is equivalent to a slope angle of 2.86°. This slope angle is usually interpreted to refer mainly to transverse slopes, where floating track runs parallel to or diagonally across the slope. No guidance is currently available regarding the maximum design slope for floating tracks crossing a slope longitudinally. For all floating tracks on sloping ground, retention support may be required on the downslope side to prevent distortion and downhill translation of the track (WSP, 2006).

2.9 It should be noted that minor sections with peat depth slightly below the design cut-off or with a slightly higher slope angle can form part of a longer section of floating track. These should be kept to a practical minimum for constructability reasons.

2.10 For this assessment, with respect to a design cut-off depth, 1.0 m has been used.

2.11 Two sections of track have been identified that fit the design criteria. Section 1 is between Turbines 4 and 7, over a distance of 127 m with peat depth averaging 1.36 m. Section 2 is between Turbine 12 and the substation, over a distance of 118 m with peat depth averaging 1.47 m.

2.12 The reduction in peat volume requiring excavation is documented below under Peat Management Plan below.

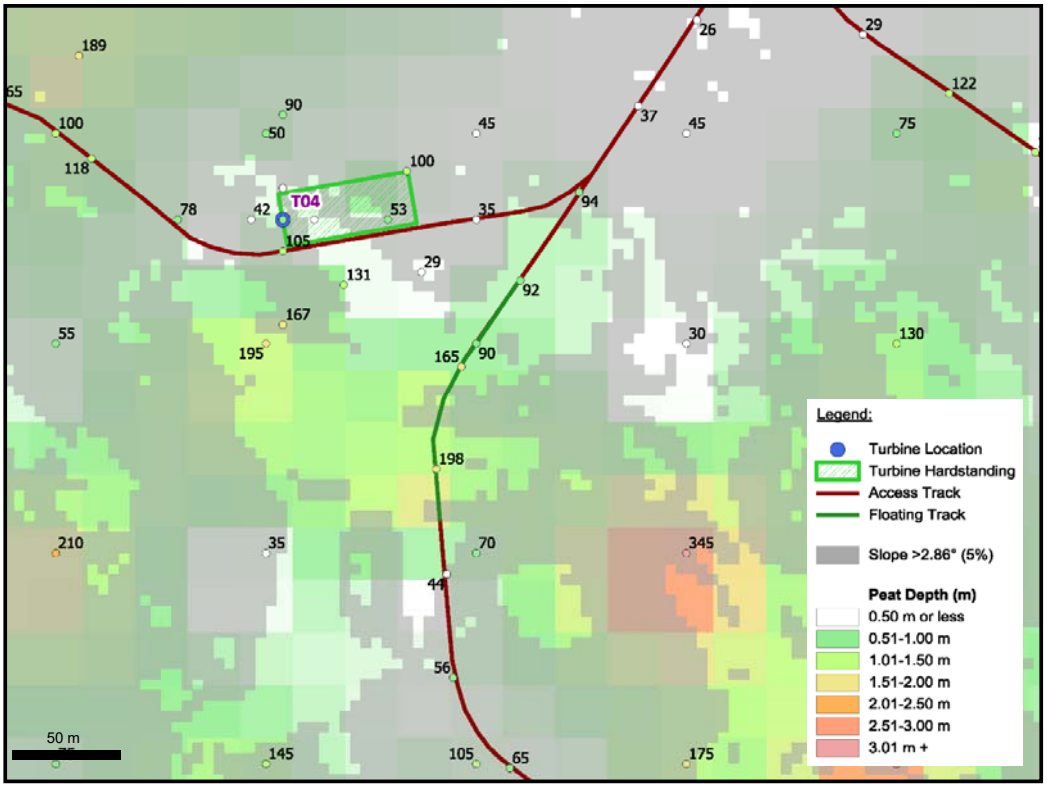


Figure 2.1. Floating track section 1

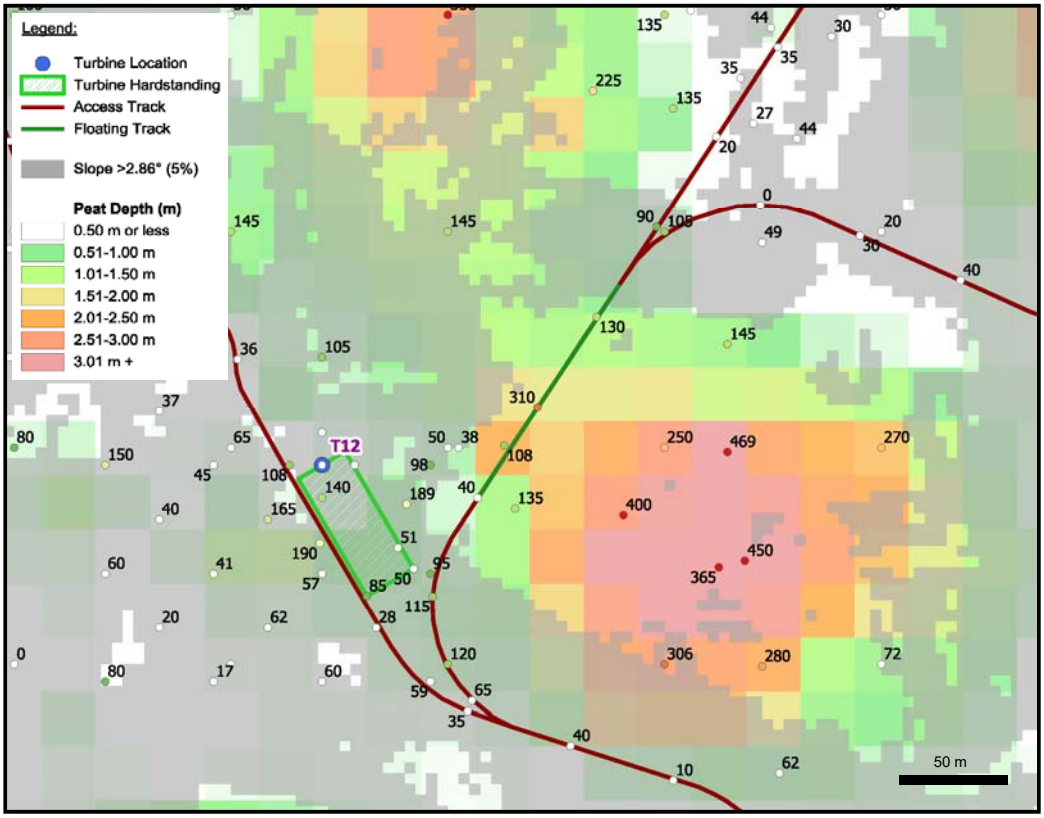


Figure 2.2: Floating track section 2

2.13 It is considered that the identification of 245 m of proposed floating access track to be installed will reduce the effects reported in the EIA Report. This reduction in effect is considered likely to be a notable change but, as reported effects in the EIA Report were not significant, will not influence that outcome.

2.14 Two other sections of track in particular were identified by SEPA as preferable to be floated, namely the approaches to Turbine 2 and Turbine 16. On the basis of the floating track suitability criteria set out above, together with initial consideration of the peat slide risks of floating these sections, it was decided to realign both approaches.

Peat slide risk assessment

2.15 This section should be read with reference to Technical Appendix 9.1.

2.16 A peat slide risk assessment was undertaken for the proposed development and was submitted to the Energy Consents Unit in March 2019. A response was received from the Energy Consents Unit in July which identified a number of points requiring clarification or additional information.

2.17 The changes to the access track layout and associated modifications to the hardstanding orientations for Turbines 2 and 16 required an additional visit to the development area to gather peat depth data for the new access track and turbine hardstanding areas. As a result, the peat slide risk assessment has been updated with this new information.

Peat depth survey

2.18 Initial peat depth surveys were undertaken in 2014, 2016 and July 2018 to gain an overview of the peat distribution across the proposed development area.

2.19 A second phase of surveys, focusing on proposed infrastructure locations, was undertaken in September and November 2018.

2.20 An additional peat depth survey was undertaken in September 2019 to gather peat depth information for specific areas of the site where alterations to the access route were being proposed as a means of managing the volumes of peat that would need to be excavated during the construction phase of the project.

2.21 This latest survey covered the new access routes to Turbines 2 and 16, including the revised locations for the turbine hardstandings. Additional peat depth data were gathered near Turbines 5 and 7 to inform potential micrositing options at a later stage. Peat probing point locations were recorded using a handheld GPS with typical accuracy of ±5 m and peat depths were measured to an accuracy of ±0.01 m. All measurements were recorded to full depth/point of refusal.

2.22 **Table 2-1** provides a summary of all the peat depth data collected for the project, including the latest data from September 2019.

Table 2-1: Summary of peat depth probing results. Table includes summary data from Technical Appendix 9.1 for comparison

Peat depth range (m)	No. of points (previous data in brackets)		Percentage of points (previous data in brackets)	
0.00	21	(20)	1.3%	(1.3%)
0.01 – 0.50	886	(859)	55.7%	(55.6%)
0.51 – 1.00	381	(369)	23.9%	(23.9%)
1.01 – 1.50	149	(146)	9.4%	(9.4%)
1.51 – 2.00	78	(77)	4.9%	(5.0%)
2.01 – 2.50	41	(39)	2.6%	(2.5%)
2.51 – 3.00	15	(15)	0.9%	(1.0%)
3.01 – 3.50	17	(17)	1.1%	(1.1%)
3.51 – 4.00	2	(2)	0.1%	(0.1%)
4.01 +	2	(2)	0.1%	(0.1%)
Total:	**1,592**	**(1,546)**	**100.0%**	**(100.0%)**

Indicative peat depth mapping

2.23 Following the peat depth survey undertaken in September 2019, the indicative peat depth mapping has been updated to take into account the new data. The process of interpolation followed the same method as provided in Technical Appendix 9.1 of the EIA Report. The revised indicative peat depth map for the project area is provided in Figure SEI-4.1.

Hazard and risk assessment

2.24 The hazard and risk assessment has also been updated to take account of the new data. The assessment process followed the same method as provided in Technical Appendix 9.1 of the EIA Report.

2.25 The Likelihood of a peat landslide occurring has been calculated using the Infinite Slope Model, to derive a Factor of Safety for each measured point and for each grid cell. These results have been used to map the likelihood of a peat landslide occurring at each point and for each grid cell across the project area. The results are presented in Figure SEI-4.2 and a summary is provided in **Table 2-2**.

2.26 Slope data for the calculations have been derived from a Digital Terrain Model at 5 m resolution. This DTM was used to generate a slope raster map within the GIS software, which could then be interrogated for slope angles at points and to produce the maximum slope angle present within the grid cells.

Table 2-2: Summary of Infinite Slope Model results. Results from previous assessment are provided for comparison

Likeli-hood	Factor of Safety	No. of points		% of points		No. of cells		% of cells	
Nil	No peat	907	(877)	57.0	(56.8)	892	(892)	36.0	(36.0)
Negligible	2.5 +	645	(628)	40.5	(40.7)	1,407	(1,407)	56.7	(56.7)
Unlikely	1.3 to <2.5	39	(38)	2.4	(2.5)	144	(144)	5.8	(5.8)
Likely	1.1 to <1.3	0	(0)	0.0	(0.0)	13	(13)	0.5	(0.5)
Probable	1.0 to <1.1	1	(1)	0.1	(0.1)	8	(8)	0.1	(0.1)
Almost certain	<1.0	0	(0)	0.0	(0.0)	17	(17)	0.7	(0.7)
	Totals	**1592**	**(1,544)**	**100**	**(100.0)**	**2,481**	**(2,481)**	**100.0**	**(100.0)**

2.27 Adverse consequence has been assessed taking account of environmental sensitivity, including potential consequences to water quality from peaty debris and habitat loss by peat removal and by blanketing of sensitive areas with peat debris, and economic significance, including damage to infrastructure and construction delays resulting from a peat landslide, in line with current guidance (Scottish Government, 2017).

2.28 Adverse consequence has been assigned as follows:

- **Very high consequence:** A835, wind turbine foundations, substation, areas of very sensitive habitat/GWDTE, private water supply source;
- **High consequence:** watercourse 50 m buffer, areas of sensitive habitat, turbine hardstandings, substation or construction compounds;
- **Moderate consequence:** areas of moderately sensitive habitat, access tracks;
- **Low consequence:** areas of low sensitivity habitat, borrow pits;
- **Very low consequence:** damaged or degraded habitat.

2.29 Results from the Consequence assessment are provided in **Table 2-3**. The adverse consequence mapping is provided in Figure SEI-4.3.

Table 2-3: Summary of adverse consequence ratings. Results from previous assessment are provided for comparison

Adverse consequence	No. of cells		% of cells	
Very high consequence	221	(221)	8.9	(8.9)
High consequence	459	(454)	18.5	(18.3)
Moderate consequence	253	(256)	10.2	(10.3)
Low consequence	1,548	(1,550)	62.4	(62.5)
Very low consequence	0	(0)	0.0	(0.0)

2.30 The Likelihood and Consequence assessments have then been combined to produce an estimate of risk for each grid cell within the project area, using the risk matrix provided in **Table 2-4**.

Table 2-4: Risk assessment matrix

		Adverse consequence				
		Extremely high	High	Moderate	Low	Very Low
Peat landslide likelihood	Almost certain	High	High	Moderate	Moderate	Low
	Probable	High	Moderate	Moderate	Low	Negligible
	Likely	Moderate	Moderate	Low	Low	Negligible
	Unlikely	Low	Low	Low	Negligible	Negligible
	Negligible	Low	Negligible	Negligible	Negligible	Negligible

2.31 A summary of the risk ranking for the grid cells across the project area is provided in **Table 2-5**. The risk ranking mapping is provided in Figure SEI-4.4.

Table 2-5: Summary of risk ranking and appropriate mitigation. Results from previous assessment are provided for comparison

Risk ranking	No. of grid cells	% of grid cells	Appropriate mitigation
High	0 (0)	0.0 (0.0)	Avoid development at these locations
Moderate	19 (19)	0.7 (0.7)	Development should not proceed unless risk can be avoided or mitigated at these locations, without significant environmental impact, in order to reduce risk ranking to low or negligible
Low	208 (215)	8.4 (8.7)	Development may proceed pending further investigation to refine assessment, and mitigate hazard through relocation or re-design at these locations
Negligible	1,362 (1,355)	54.9 (54.6)	Development should proceed with monitoring and mitigation of peat landslide hazards at these locations as appropriate
No peat	892 (892)	36.0 (36.0)	No peat landslide hazard

2.32 In line with the previous assessment, most of the area has been assessed as having a negligible risk of peat landslide, or of having no peat (90.9%). The revised assessment indicates 19 grid cells have been assessed as having a moderate risk of peat landslide, this is identical to the previous assessment, and no cells with a high risk.

2.33 Of the 19 grid cells assessed as having moderate risk, two are located within the project area. Detailed assessment has already been undertaken for these areas in Technical Appendix 9.1 of the EIA Report and none of the details have changed subsequently.

2.34 Although located outwith the project area boundary, the remaining 17 cells have been assessed to determine if a natural peat landslide could have an adverse impact on the development area and any key infrastructure downslope of the identified cells.

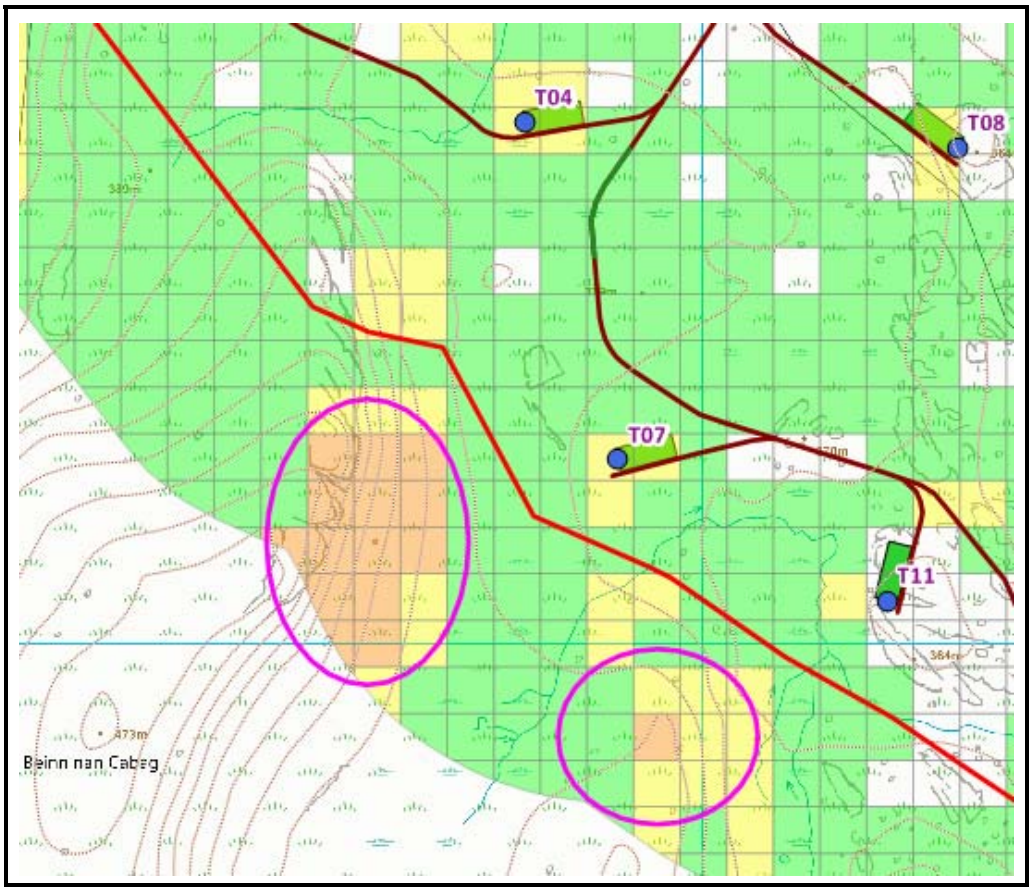
Detailed Assessment and Mitigation

2.1 Neither of the two new revised sections of track and realigned hardstandings are subject to any greater than low risk

2.2 Two groups of cells – a cluster of 16 cells and one single cell – have been identified as having a moderate risk of peat landslide. These cells are located outwith the project area boundary but are assessed here to identify whether there may be any risk to project infrastructure as a result of any slope failure associated with these cells. The assessment considers the data used in the assessment, the cells immediately around those highlighted, drainage features and the nature of the proposed nearby infrastructure. Where relevant, mitigation measures are recommended to reduce or control the risk for

the areas. All areas identified for detailed assessment are indicated on Figure SEI-4.4, although only two are assessed here.

2.3 As the areas assessed here are beyond the project area boundary, consideration has been given only to the potential risk to project infrastructure. The grid cells in each map are 50 x 50 m, to give an indication of scale. Green cells have negligible risk; yellow cells have low risk; orange cells have moderate risk. Blank cells have no peat as defined in the PLHRA Guidelines (Scottish Government, 2017).



A cluster of 16 cells is located south of the project area boundary, on the slopes of Beinn nan Cabag. Although the slopes in this area are steep, observations from the site reconnaissance indicate that there is no peat development on this area. This is largely as a result of the slope, as it is too steep to allow peat growth to establish.

This area has demonstrated a tendency to natural landslides, as recorded in Technical Appendix 9.1 of the EIA Report. None of the landslides that have occurred have come close to the project area boundary and all have a relatively short run-out area despite forming on steep slopes. It is likely, therefore, that any further landslides on this slope would not affect any of the development infrastructure as the intervening flat-lying ground would result in dissipation of energy from a slide.

One additional cell is also located south of the project area boundary, on the slopes of an unnamed small hill. A landslide in this area could travel towards Turbines 7 or 11. The peat depth in this area is an artefact of the digital interpolation, as there are no actual measurements beyond the project area boundary. Peat for this cell has been interpolated as 1.99 m deep, which is likely to be substantially higher than actual peat depths on this slope.

Interrogation of the aerial imagery shows that bedrock is present at surface for much of this cell. In addition, both Turbines 7 and 11 are upslope of the natural run-out areas for any potential failure, and are also on the opposite side of a watercourse which would be likely to catch any debris from the slope should failure occur. It is likely, therefore, that any potential landslide on this slope would not affect any of the development infrastructure.

Peat slide risk associated with blasting for aggregate

2.4 The response from the Energy Consents Unit requested that consideration is given to management of peat slide risk in relation to the use of blasting for aggregate, as blasting has been proposed as a means for extracting bedrock from the two proposed borrow pit locations.

2.5 It is recognised that shock waves from blasting have the potential to travel through the bedrock and could, potentially, be associated with triggering instability in peat areas at some distance from the borrow pit sites. Both borrow pit sites have been located within areas with minimal or no peat, to restrict the potential for induced peat slide adjacent to the borrow pit areas.

2.6 All blasting will be under the supervision of a qualified and experienced blast engineer. The smallest practicable amount of explosive would be used in order to minimise shock waves resulting from the blast. Additional pre-drilling of the blast face may be appropriate to provide a higher level of control of the blast, particularly if this allowed use of smaller amounts of explosive; this would be undertaken on the advice of the blast engineer on the site.

2.7 Significant excavation works at Turbines 3 and 8 would be restricted when blasting for aggregate is planned. Works would only continue after appropriate inspections have determined that ground instability has not arisen as a result of the blast.

2.8 Visual peat monitoring would be undertaken following periods of blasting, to inspect nearby infrastructure locations for any signs of potential instability. This would include recording any signs of cracking or mounding of peat, which can be the early signs of slippage. It is recommended that infrastructure and peat areas within 500 m of the blasting location are visited, with additional locations if relevant as recommended by the Environmental Clerk of Works.

2.9 Blasting may be restricted in periods of significant wet weather, upon the advice of the blast engineer. Wet weather definitions are provided in Technical Appendix 9.4 Peat Management Plan of the EIA Report.

Peat management plan

2.10 This section should be read with reference to Technical Appendix 9.4 of the EIA Report.

Peat excavation volumes

2.11 Revisions to the proposed track layout and the inclusion of two sections of floating track have required reassessment of the calculated estimated volumes of peat that need to be excavated for the development, and also to the calculated volumes of peat that can be reused within the development.

2.12 In line with the initial calculations provided in Technical Appendix 9.4, the acrotelm has been assumed to form the uppermost 0.5 m where peat is present. Acrotelm is known to vary in thickness, but it is recommended that peat turves are excavated to approximately 0.5 m where possible, including the uppermost part of the catotelm, to promote quicker regeneration of disturbed areas following reinstatement.

2.13 Volumes of peaty soil and topsoil have not been included, in line with the definition of peat quoted in the main appendix text. Soils will also require excavation but are less sensitive than peat to both excavation and restoration.

2.14 The revised volumes of peat that would require excavation for track construction are set out in **Table 2-6** below, together with the previously calculated volumes for comparison.

Table 2-6: Peat excavation volumes for access tracks, including passing places and turning heads, and trackside drainage. Table includes previous volumes for comparison

Scheme element	Acrotelm (m^3)	Catotelm (m^3)	Total (m^3)	Difference (m^3)
Track section 1 (unchanged)	2,298	276	2,574	0
Track section 2 (original)	5,777	4,287	10,063	-424
Track section 2 (revised)	5,588	4,051	9,639	
Track section 3 (original)	7,540	5,920	13,460	+289
Track section 3 (revised)	7,734	6,015	13,749	
Track section 4 (original)	6,207	6,083	12,289	-2,204
Track section 4 (revised)	5,793	4,292	10,085	
Track section 5 (unchanged)	3,338	3,093	6,431	0
Track section 6 (original)	7,899	8,639	16,539	-2,963
Track section 6 (revised)	7,017	6,559	13,576	
Track section 7 (original)	5,131	6,624	11,755	-3,320
Track section 7 (revised)	5,143	3,292	8,435	
Total (original)	**38,190**	**34,922**	**73,113**	**-8,624**
Total (revised)	**36,911**	**27,578**	**64,489**	

2.15 Track sections 4 and 6 include the newly proposed sections of floating track. Track sections 3 and 7 include the rerouted access links to Turbines 16 and 2, respectively. Calculations for track sections 2 and 4 have been revised in order to make use of additional peat depth data around Turbines 5 and 7, respectively, gathered to inform micrositing options at these locations.

2.16 The small additional peat excavation requirement for track section 3 is a result of the small increase in track length to give access to Turbine 16, from 301 m to 385 m. This increase is more than balanced by the decreases in peat volumes for the other revised track sections.

2.17 Overall, reduction in excavation volumes from the access track of approximately 12% has been achieved.

2.18 The revised volumes of peat that would require excavation for construction of turbine foundations, hardstanding areas and crane pads, plus associated drainage, are provided in **Table 2-7**.

Table 2-7: Peat excavation volumes for turbines, hardstandings, crane pads and associated drainage. Table includes previous volumes for comparison

Scheme element	Acrotelm (m^3)	Catotelm (m^3)	Total (m^3)	Difference (m^3)
Turbine 1 (unchanged)	462	102	564	0
Turbine 2 (original)	No peat			+505
Turbine 2 (revised)	404	101	505	
Turbine 3 (unchanged)	359	40	399	0
Turbine 4 (unchanged)	924	721	1,644	0
Turbine 5 (original)	1,010	1,124	2,134	-233
Turbine 5 (revised)	970	931	1,901	
Turbine 6 (unchanged)	606	501	1,107	0
Turbine 7 (original)	1,386	1,843	3,229	-181
Turbine 7 (revised)	1,078	1,970	3,047	
Turbine 8 (unchanged)	462	32	494	0
Turbine 9 (unchanged)	404	445	849	0
Turbine 10 (unchanged)	1010	715	1,726	0
Turbine 11 (unchanged)	No peat			0
Turbine 12 (unchanged)	808	740	1,721	0
Turbine 13 (unchanged)	No peat			0
Turbine 14 (unchanged)	180	65	244	0
Turbine 15 (unchanged)	1010	736	1,746	0
Turbine 16 (original)	898	1,308	2,206	-710
Turbine 16 (revised)	736	761	1,496	
Turbine 17 (unchanged)	202	12	214	0
Total (original)	**9,722**	**8,382**	**18,276**	**-619**
Total (revised)	**9,615**	**7871**	**17,658**	

2.19 The most noticeable change is that Turbine 2 hardstanding has been moved to an area with some (mainly shallow) peat, from an area with none. This was required by the change

to the access route, which has necessitated a change in orientation of the hardstanding area.

2.20 The additional peat depth measurements for Turbines 5 and 7 have allowed a recalculation of peat excavations, and the consequent small downwards adjustments of approximately 11% and 6% respectively. The additional data confirm that micrositing of both turbines and hardstanding areas away from the areas of deeper peat is possible within the 50 m micrositing allowance.

2.21 The change to the access route to Turbine 16 has necessitated a change in orientation of the hardstanding area, resulting in an approximately 32% reduction in calculated peat volumes.

2.22 There have been no changes to any of the additional infrastructure, so revised peat volume calculations have not been provided.

2.23 A summary of the total revised peat volumes is provided in **Table 2-8**. Overall, a reduction in excavation volumes of approximately 10% has been achieved.

Table 2-8: Summary of peat excavation volumes

Scheme element	Acrotelm (m^3)	Catotelm (m^3)	Total (m^3)	Difference (m^3)
All tracks (original)	38,190	34,922	73,113	-8,624
All tracks (revised)	36,911	27,578	64,489	
All turbine infrastructure (original)	9,722	8,382	18,104	-619
All turbine infrastructure (revised)	9,615	7,871	17,658	
All other infrastructure (unchanged)	3,652	1,332	4,983	0
Total (original)	**51,564 (54%)**	**44,636 (46%)**	**96,200**	**-9,242**
Total (revised)	**50,177 (58%)**	**36,781 (42%)**	**86,958**	

Peat reuse volumes

2.24 Options for peat reuse remain unchanged from those presented in Appendix 9.4 of the EIA Report.

2.25 The changes to the infrastructure layout and calculated peat volumes to be excavated have required recalculation of the volumes of peat that can usefully be reused within the wind farm.

2.26 Some additional changes to the calculations have been made, as requested by SEPA to ensure that reinstatement is managed appropriately. Estimates for reinstatement and dressing off have been revised to assume a maximum depth of 0.6 m and a maximum width of 2.5 m from the infrastructure or track margin, in line with SEPA's observations and experience at other sites.

2.27 Estimated peat volumes for reuse are provided in **Table 2-9**.

2.28 The balance between peat used for peatland restoration and borrow pit restoration would be determined on the ground, following assessment of the peatland areas that would

benefit most from restoration works. Total peat volumes used for borrow pit restoration will not exceed the figures provided above.

Table 2-9: Estimated peat volumes for different reuse options. Table includes previous volumes for comparison.

Reuse option	Acrotelm (m^3)	Catotelm (m^3)	Total (m^3)	Difference (m^3)
Dressing off edges of construction infrastructure (original)	8,800	1,000	9,800	-1,600
Dressing off edges of construction infrastructure (revised)	7,400	800	8,200	
Reinstatement of construction infrastructure (unchanged)	10,100	1,100	11,200	0
Verge reinstatement, cross-slope tracks (original)	9,700	-	9,700	-3,200
Verge reinstatement, cross-slope tracks (revised)	6,500	-	6,500	
Verge reinstatement, other tracks (original)	13,600	-	13,600	-2,100
Verge reinstatement, other tracks (revised)	11,500	-	11,500	
Temporary drainage reinstatement (unchanged)	500	1,500	2,000	0
Borrow pit restoration (unchanged)	8,200	16,500	24,700	0
Peatland restoration (original)	1,500	23,500	25,000	-2,100
Peatland restoration (revised)	5,900	17,000	22,900	
Totals (original)	**52,400**	**43,600**	**96,000**	**-9,000**
Totals (revised)	**50,100**	**36,900**	**87,000**	

Watercourse crossing assessment

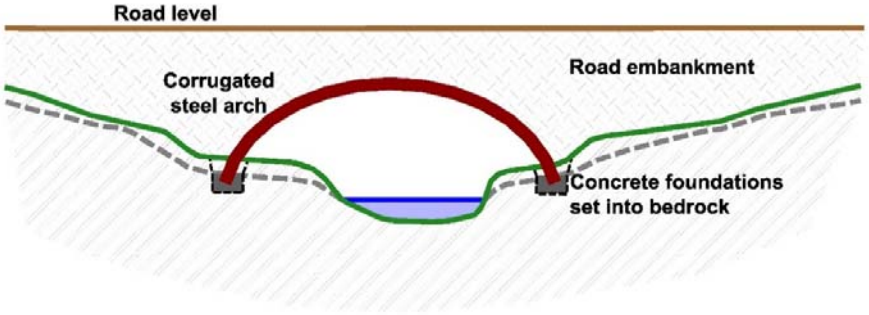
2.29 The changes to the wind farm track route in order to minimise overall impacts on peat have resulted in the requirement for an additional watercourse crossing not covered in Appendix 8.1. This crossing is located on the access track link to Turbine 2. Locations of all crossings are provided in Figure SEI-4.5.

2.30 The crossing location was visited in September 2019 to ensure that appropriate field notes and photographs were gathered for the location. The location was recorded using a hand-held GPS unit, with better than 5 m accuracy.

2.31 Crossing details are provided below. These include photographs of the watercourse and a recommendation of the crossing type to be used. The crossing structure will be sized suitably to allow for high flow levels during rainstorm events; details will be provided at detailed design stage.

Watercourse Crossing Details

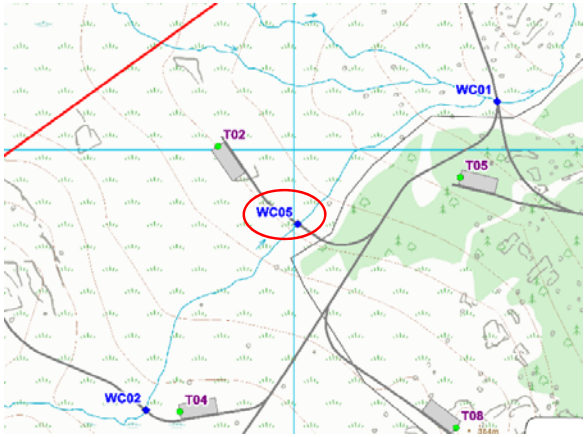
Crossing:	WC05
Location:	Between T02 and T08
Watercourse:	Allt Glac an t-Sìthein
NGR:	NH 3600 6787
Description:	Narrow peat channel with underground section just upstream of crossing. Water upwelling visible. Poorly defined at crossing, becoming more distinct downstream. Width 0.5-1 m, some overland flow apparent adjacent to channel.
Catchment Area:	0.19 km^2
Crossing Type:	Bottomless arch culvert or bridge



Indicative cross-section, not to scale

View downstream (north) at NH 3600 6787 showing indistinct peat channel, becoming more defined downstream.

View of channel at NH 3600 6787, showing indistinct nature of channel and overland flow through adjacent vegetation.



Response to SEPA

2.32 SEPA's dominant concern related to the total volumes of peat that would require excavating in order for the development to be constructed. The principal changes that have been undertaken to address this are as follows:

- Two sections of floating track, where no peat excavation would be required;
- Changes to the access track routes to Turbines 2 and 16, giving reduced peat excavation requirements;
- Change to the hardstanding alignment for Turbine 16, as a result of the realigned access, also resulting in reduced peat excavation requirements;
- Increased resolution of peat depth data at Turbines 5 and 7, allowing more accurate calculations of peat excavation requirements for these locations.

2.33 The realignment of the turbine hardstanding for Turbine 2 has slightly increased the total peat excavation requirement for this turbine; however, this is significantly outweighed by the reduced peat excavation requirement for the Turbine 2 access route, as well as by other savings as outlined above.

2.34 An overall reduction in anticipated peat excavation of almost 10% has been achieved through these measures.

2.35 The additional peat depth data also confirm that, whilst micrositing options at Turbines 5 and 7 are practical within the 50 m buffer, the impacts of the as-submitted arrangements are 11% and 6% lower than originally considered in any case.

References

FCE & SNH (2010). Floating Roads on Peat. Forestry Civil Engineering and Scottish Natural Heritage, August 2010. Available at: http://www.roadex.org/wp-content/uploads/2014/01/FCE-SNH-Floating-Roads-on-Peat-report.pdf

Scottish Government (2017). Peat landslide hazard and risk assessments: best practice guide for proposed electricity generation developments. Available at https://www.gov.scot/publications/peat-landslide-hazard-risk-assessments-best-practice-guide-proposed-electricity/

WSP (2006). Geo-environmental Considerations with respect to Construction of Access Tracks on Peat. Report for SHETL, May 2006. Available at: https://www.ssen.co.uk/WorkArea/DownloadAsset.aspx?id=3079

3 LANDSCAPE AND VISUAL IMPACT

Background

3.1 Chapter 4 of the Environmental Impact Assessment Report (EIAR) contained a detailed Landscape and Visual Impact Assessment (LVIA) in respect of the proposed development. This comprised:

- a description of the methodology utilised in completing the assessment;
- a description of the existing landscape and visual baseline context and cumulative context at the time of completion of the LVIA based on THC's cumulative database (available at https://www.highland.gov.uk/downloads/file/1019/wind_farm_project_list_january_2019);
- a description of impact generators associated with the type of development proposed and their potential effects on landscape and visual receptors;
- a description of design priorities and mitigation measures proposed to address likely significant landscape and visual effects; and
- an assessment of residual landscape and visual effects, including cumulative effects taking into account the influence of design responses and mitigation measures.

3.2 The LVIA was accompanied by a series of Technical Appendices (TAs) that provided detailed assessment of residual effects on the landscape and visual resource, including:

- TA 4.4: Assessment of Residual Effects on Landscape Character Types;
- TA 4.5: Assessment of Residual Effects on Designated Landscapes and Classified Landscapes;
- TA 4.6: Wild Land Impact Assessment (WLIA);
- TA 4.7: Viewpoint Assessment;
- TA 4.8: Route Analysis; and
- TA 4.9: Lighting Assessment.

3.3 The LVIA was also accompanied by a series of figures and visualisations, including visualisations showing night views from a series of key viewpoints.

Supplementary Assessments

3.4 Subsequent to the submission of the EIAR both The Highland Council and Scottish Natural Heritage have requested some supplementary information/assessments in order to aid their deliberations in respect of the proposed development. The supplementary landscape and visual information comprises:

- An assessment of potential lighting impacts on Wild Land Areas (WLAs) 28 (Fisherfield - Letterewe – Fannichs) and 29 (Rhiddoroch – Beinn Dearg – Ben Wyvis); and

- An assessment of the potential cumulative effect attributable to the proposed development when the proposed Lochluichart Extension II (at scoping at the time of the preparation of the LVIA) is included in the cumulative context.

3.5 This additional assessment material is accompanied by the following figures:

- Figure 5.1: Lighting Intensity (Cardinal Lights);
- Figure 5.2: Intervisibility of Lochluichart, Corriemoillie and Kirkan Turbine Lights;
- Figure 5.3: Cumulative ZTV: Kirkan, Lochluichart and Lochluichart II;
- Figures 5.4a: Viewpoint 6 (Summit of Ben Wyvis) Baseline View;
- Figures 5.4b: Viewpoint 6 (Summit of Ben Wyvis) Night Visualisation;
- Figures 5.4c: Viewpoint 6 (Summit of Ben Wyvis) Night Visualisation - Cardinal Lighting;
- Figures 5.5a: Viewpoint 13 (Summit of Faire nam Fiadh, Fannich range) – Baseline View;
- Figures 5.5b: Viewpoint 13 (Summit of Faire nam Fiadh, Fannich range) – Night Visualisation;
- Figure 5.5c: Viewpoint 13 (Summit of Faire nam Fiadh, Fannich range) – Night Visualisation – Cardinal Lighting);
- Figure 5.6a: Viewpoint 14 (Beinn Dearg) – Baseline View;
- Figure 5.6b: Viewpoint 14 (Beinn Dearg) – Night Visualisation;
- Figure 5.6c: Viewpoint 14 (Beinn Dearg) – Night Visualisation – Cardinal Lighting; and
- Figures 5.7a to 5.7s: Annotated Wirelines for all Viewpoints.

Night assessment from Wild Land Areas (WLAs) 28 and 29

3.6 TA 4.6: Wild Land Impact Assessment in Volume 2 of the EIAR contains a detailed assessment of likely impacts on the key characteristics of WLAs 28 (Fisherfield - Letterewe – Fannichs) and 29 (Rhiddoroch – Beinn Dearg – Ben Wyvis) but does not address night impacts. The assessment was undertaken in accordance with the consultation draft guidance published by SNH in 2017[1] and with regard to the WLA Descriptions published in 2017[2] at the behest of SNH. The WLIA concluded that there would be no significant effects on either WLA.

3.7 Whilst SNH are keen to evaluate the potential effect of possible aviation lighting utilised for the proposed development upon the WLAs, it is noted that there is no mention in the Wild Land Descriptions for WLAs of the night characteristics of either landscape, and that key characteristics that are detailed the descriptions would be difficult if not impossible to appreciate after dark. Whilst it is assumed, for the purposes of this submission, that the

[1] Available from https://www.nature.scot/assessing-impacts-wild-land-technical-guidance-2017

[2] Available at https://www.nature.scot/wild-land-area-descriptions

absence of artificial light sources within the WLAs adds to their perceived remoteness and high degree of naturalness in the WLA, such qualities are not exclusive to WLAs.

3.8 TA 4.9: Lighting Assessment contains a description of the baseline context in respect of artificial lighting and identifies notable sources of artificial light within and adjoining the A835 corridor. Whilst located outwith the WLAs, the Lochluichart turbine lights (which have a 200-candela intensity) as well as vehicle headlights on the A835 and other public highways as well as within scattered settlements can appear relatively bright and can form prominent elements in views out from the WLAs during periods of clear visibility, mainly from elevated summits within the eastern half of WLA 28 - Fisherfield - Letterewe – Fannichs and within the southern and eastern areas of WLA 29- Rhiddoroch – Beinn Dearg – Ben Wyvis. Whilst theoretically visible, the low intensity lights (25-candela) on Corriemoillie turbines would be of relatively lesser prominence and perceived brightness, especially in views from distant summits within the WLAs. Views from south-eastern parts of WLA 29 would also have visibility of lighting down into and surrounding the Cromarty Firth.

3.9 Figure 5.2: Intervisibility of Lochluichart, Corriemoillie and Kirkan Turbine Lights indicates that even under the 'worst case' scenario (were a Cardinal Lighting scheme, and/or any other mitigation measures, not approved by the CAA) the proposed development would not increase the geographical extent of the WLA 28 subject to the influence of aviation lighting, the proposed development appearing east of this WLA, beyond the intervening Lochluichart and Corriemoillie turbine lights. Similarly, with the exception of the western side of Loch Vaich and adjoining elevated slopes of Strathvaich Forest, the visibility of the proposed developments lights within WLA 29 would coincide with those of Corriemoillie and Lochluichart arrays. Consequently, the principal effect of introducing lights at the proposed development site would be cumulative and concern either an increase in the horizontal spread of light sources in views (e.g. in views from summits to the north of the proposed development) or an increase in the number and prominence of lights where the proposed development overlaps with the Lochluichart and Corriemoillie arrays (e.g. in views from Ben Wyvis and Little Wyvis or from the interior of the Fannichs). The effect of the proposed developments lights at a number of viewpoints is illustrated in Figures 5.4a to 5.6b and described below, whilst the annotated wirelines in Figures 5.7a to 5.7s indicate the turbine numbers for all of the proposed developments turbines. Turbine numbers shown in blue in the wirelines relate to the cardinal turbines that would be lit if the proposed cardinal lighting scheme (as shown at Figure 12.1 of the EIAR) were to be adopted, in accordance with the response received from CAA 13th September[3].

Viewpoint 6: Ben Wyvis

3.10 Figure 5.4a indicates that lighting on all seventeen of the proposed developments turbines would be visible from this location. According to the analysis in Figure 5.1: Light Intensity, the lights would appear with a source intensity of 200 candela (based on

[3] Email from Andrew Wells (Policy Lead Spectrum and Surveillance Policy, Civil Aviation Authority) to Ian Fletcher (Wind Business Support), responding to request for comment on the proposed cardinal lighting scheme:

> *"…I have reviewed your proposed aviation obstruction lighting plan for the Kirkan Wind Farm proposed development. I am content that the lighting plan appears to be in the spirit of the proposed CAA policy direction…Due to the inherent uncertainties with the future content and timescales associated with any change to UK policy, I would highlight that we must agree the final lighting plan prior to construction."*

assumed reduction in light intensity in periods of clear meteorological visibility of over 5 km) and would appear in the context of, and overlapping with, the more distant lighting of Lochluichart and low intensity lights of Corriemoillie wind farm. The proposed developments lighting would add to the existing lighting to the west of this location, further reducing the perceived remoteness at this viewpoint and constituting a localised significant additional and in-combination effect. In the event that the proposed cardinal lighting scheme is adopted, there would be fewer lights evident, as illustrated in Figure 5.4b, with a consequent reduction in the prominence of the proposed development after dark. As no other characteristic of the WLA or link to adjacent WLAs would be apparent at this viewpoint after dark it is debateable as to the significance of the effect on the WLA, especially given that lighting is an existing feature of views to both the west and particularly south-east, both in the middle-ground at Lochluichart Wind Farm and at more distant locations adjoining the Cromarty Firth where settlements form prominent sources of artificial light.

Viewpoint 13 (micro-sited): Summit of Faire nam Fiadh – Fannich

3.11 Figure 5.5a shows ten of the nacelle lights visible at the proposed development site, lights on the remaining seven turbines being obscured by intervening topography. According to the analysis in Figure 5.1: Light Intensity, the lights would appear with a source intensity of 200 candela (based on assumed reduction in light intensity in periods of clear meteorological visibility of over 5 km). The proposed development would be overlapped by the intervening Lochluichart schemes, which are subject to 200 candela lights on cardinal turbines and would therefore be seen in the context of existing lit forms. The proposed development would nonetheless constitute a horizontal and numerical increase in lighting to the east of this viewpoint, resulting in an increase in the influence of lighting at this location, reducing the perceived remoteness at this viewpoint. However, should use of cardinal lighting be approved for the proposed development as anticipated, the number of lights visible at the site would reduce to three and would be consistent with the lighting of the intervening Lochluichart development. In this context, no significant effect would be experienced at this viewpoint.

Viewpoint 14: Beinn Dearg

3.12 Figure 5.6a shows all seventeen of the proposed developments lights visible. According to the analysis in Figure 5.1: Light Intensity, the lights would appear with a source intensity of 200 candela from a distance of (based on assumed reduction in light intensity in periods of clear meteorological visibility of over 5 km). The proposed development would be seen separate and distinct from the cardinal lights of the Lochluichart wind farms. Consequently, the proposed development would constitute a horizontal and numerical increase in lighting to the southeast of this viewpoint, resulting in an increase in the influence of lighting at this location, reducing the perceived remoteness at this viewpoint. However, should cardinal lighting be used for the proposed development, the number of lights visible at the site would reduce to six and would be more consistent with the appearance of the Lochluichart development. In this context, no significant effect would be experienced at this viewpoint.

Conclusion

3.13 The wild land characteristics of WLA 28 and 29, as describe in SNHs published Wild Land Areas Descriptions do not include reference to night characteristics or darkness. It may be that such characteristics might include dark skies and an absence of artificial light sources within the WLA and limit to the extent of such lighting in landscapes adjacent to the WLA. The baseline context of both WLAs is consistent with this, the principal light sources outwith the WLAs being those associated with the A835 and other public highways, nearby and more distant settlements and activities including offshore rigs, as well as the Lochluichart and Corriemoillie wind farms. The proposed development would be consistent with the existing local context and, as indicated in Figure 5.2, would not result in a significant increase in the geographical extent of visibility of artificial light sources from the interior of the WLAs. The greatest impact of the proposed development would be experienced at elevated locations to the north and east of the proposed development, within WLA 29 were the proposed development has potential to reduce the perceived remoteness of the landscape at a number of summits, although not necessarily significantly so. The proposed adoption of cardinal lighting alone would reduce such impacts and create greater consistency with the existing Lochluichart developments lighting and ensuring effects on the WLAs would not be significant.

Cumulative assessment with Lochluichart Extension II

3.14 The LVIA in Chapter 4 of the EIAR and the accompanying TAs provide a detailed assessment of potential cumulative effects arising from the proposed development in conjunction with existing/operational wind farm developments, those consented but unbuilt, and those subject to a formal registered planning application in line with current guidance in respect of cumulative assessment[4].

3.15 The findings of the LVIA are outlined in Section 4.7 of the LVIA and the significant effects (including cumulative effects) are summarised in Table 4.7 therein.

3.16 The cumulative context at the time of the production of the LVIA is set out in Table 4.6: Cumulative Wind Farms of the LVIA and did not include Lochluichart Extension II ('LLE2') as this scheme was at a scoping stage at the time and therefore subject to not inconsiderable uncertainty as to its design or whether it would progress at all. However, this scheme was the subject of a formal application in April 2019, and comprised nine turbines with a maximum blade tip height of 133 m. THC have since informed the applicant for the proposed development of the developers for LLE2's decision to remove four turbines nearest to the A835 and Aultguish Inn.

3.17 A comparison of the ZTVs for the existing/consented Lochluichart and Extension (Ref. Figure 4.6a in Volume 3 of the EIAR) and the viewshed for the five turbine version of the proposed Lochluichart Extension II scheme (Ref. Figure 5.3: Cumulative ZTV: Kirkan, Lochluichart and Lochluichart II; that accompanies this SEI) indicates that the new extension would principally result in an increase in the visibility of wind farm development along the A835, between Loch Droma and the Aultguish Inn, the proposed turbines often seen as blade tips on the skyline, but occasionally glimpsed as a small number of rotors and blade tips. The proposed Lochluichart Extension II would be most prominent in views

[4] Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments.

from locations in the vicinity of the Aultguish Inn from where all five of the proposed turbines would be prominent on the skyline and seen in conjunction with the existing/consented Lochluichart and Lochluichart extension as well as existing Corriemoillie turbines. The effect of this would be to increase the prominence of wind energy development on the skyline and the in-combination effect of wind energy development. Seen from elsewhere, the proposed Lochluichart Extension II would often overlap with Lochluichart and Corriemoillie arrays, thereby adding to the existing/consented cluster of turbines. In such circumstances the perceived prominence of the proposed Lochluichart Extension II would be reduced. On the basis of the preceding analysis, the addition of the Lochluichart Extension II would represent a modest change to the cumulative context, and most notably affect the sequential experience of views from the A835, increasing the presence and influence of wind farms in this route, particularly travelling from Black Bridge where the Lochluichart Extension II turbines would emerge first and appear directly ahead in views. Seen in this context, the proposed development would still represent a significant additional effect on the amenity of the A835, but one that is also more concerned with sequential cumulative effects. In all other respects however, the inclusion of the proposed five turbine version of the Lochluichart Extension II would not alter the findings of the LVIA materially. This would also be the case if the nine turbine version of the extension were consented.

4 CONCLUDING REMARKS

Hydrology and Peat

4.1 The principal concerns raised by SEPA were in relation to peat, mostly relating to the estimated volumes of peat that would require excavation to allow wind farm construction to go ahead. Some minor redesign has allowed revised peat estimates to be reduced, but have also necessitated updates to associated assessments to take account of the changes, as shown in Section 2 above.

4.2 The realignment of the turbine hardstanding for Turbine 2 has slightly increased the total peat excavation requirement for this turbine; however, this is significantly outweighed by the reduced peat excavation requirement for the Turbine 2 access route, as well as by other savings as outlined above. An overall reduction in anticipated peat excavation of almost 10% has been achieved through these measures.

4.3 The additional peat depth data also confirm that, whilst micrositing options at Turbines 5 and 7 are practicable within the 50 m buffer, the impacts of the arrangements included within this SEI are 11% and 6% lower than was originally considered in the EIA Report (March 2019).

Landscape

4.4 The wild land characteristics of WLA 28 and 29, as described in SNH's published Wild Land Areas Descriptions do not include reference to night characteristics or darkness. It may be that such characteristics might include dark skies and an absence of artificial light sources within the WLA, and limit to the extent of such lighting in landscapes adjacent to the WLA. The baseline context of both WLAs is consistent with this; the principal light sources outwith the WLAs being those associated with the A835 and other public highways, nearby and more distant settlements and activities including offshore rigs, as well as the Lochluichart and Corriemoillie wind farms. The proposed development would be consistent with the existing local context and, as indicated in Figure 5.2, would not result in a significant increase in the geographical extent of visibility of artificial light sources from the interior of the WLAs. The greatest impact of the proposed development would be experienced at elevated locations to the north and east of the proposed development, within WLA 29 were the proposed development has potential to reduce the perceived remoteness of the landscape at a number of summits. The proposed adoption of cardinal lighting alone would reduce such impacts and create greater consistency with the existing Lochluichart development's lighting.

Other environmental disciplines

4.5 As a result of the consultations undertaken with SEPA, amendments to the access track layout included within the March 2019 EIA Report were made in order to reduce the potential requirement to excavate peat, and had the result of shortening the total length of access track and reducing the volumes of peat excavated (see Section 2). The revised layout is shown in Figure 1.1, with a comparison with the March 2019 layout shown in Figure 1.2. Beyond the detailed assessments described above in Sections 2 (hydrology

and peat) and 3 (landscape and visual impact), a summary of the implications for the other environmental subjects is provided below.

Archaeology and cultural heritage

4.6 The proposed revised access track layout does not impact on any previously identified heritage assets, or areas identified of being of archaeological potential. As a result of the modification, the impacts reported within Chapter 5 of the EIA Report (March 2019) remain the same, and no additional mitigation is proposed.

Ecology

4.7 The proposed revised access track layout reduces impacts on blanket bog habitat, and whilst resulting in an additional watercourse crossing with mitigation as proposed there would be no change in the findings of the assessment as set out in the EIA Report (March 2019).

Ornithology

4.8 No change in the impact assessment reported in the EIA Report (March 2019).

Noise and vibration

4.9 The proposed revised access tracks (Figure 1.1) are not located closer to any noise or vibration receptors identified within Chapter 10 of the EIA Report (March 2019) than the original layout (see Figure 1.2). No change in the impacts reported in the Noise and Vibration chapter of the EIA Report is predicted.

Traffic and transportation

4.10 No change in the impact assessment reported in the EIA Report (March 2019) is predicted for traffic and transportation. The overall length of access track, and therefore the raw materials required to be imported to the site, have been reduced as a result of the proposed revised layout (see Figures 1.1 and 1.2). However, the change in volume is not such that it would change the conclusions in Chapter 11 of the EIA Report.

Aviation, radar and telecoms

4.11 No change in the impact assessment reported in the EIA Report (March 2019).

Climate change

4.12 The modification of the access tracks proposed in this SEI reduces the potential volume of peat that would be disturbed by the proposed development. This would slightly reduce the carbon payback times recorded in Chapter 13 Climate Change of the EIA Report (March 2019). However the impacts reported within the chapter remain the same.

Summary of Environmental Commitments

4.13 The environmental mitigation included in Chapter 14 of the EIA Report would continue to be committed to by the applicant. Based on the additional information presented in this SEI, the following additional mitigation (as detailed in paragraphs 2.4 to 2.8 above) would be committed to.

Table 4-1 Summary of additional Environmental Commitments identified in the SEI

Ref	Issue	Description of mitigation measure (reference within text)	Timing	Responsible Party
09 Geology, Hydrogeology and Peat				
9.25	Peat landslide and blasting	Borrow pits to be located in areas with minimal or no peat to restrict the potential for peat slide adjacent to borrow pit areas (Section 2.5 of the SEI Report)	Design	Developer/ designer
9.26	Peat landslide and blasting	All blasting will be under the supervision of a qualified and experienced blast engineer. The smallest practicable amount of explosive should be used. Consider additional pre-drilling of the blast face to provide a higher level of control of the blast, following advice of the blast engineer. (Section 2.6 of the SEI Report)	Construction	Developer/ Contractor
9.27	Peat landslide and blasting	Significant excavation works at Turbines 3 and 8 to be restricted when blasting for aggregate is planned. Works would only continue after appropriate inspections have determined that ground instability has not arisen as a result of the blast. (Section 2.7 of the SEI Report)	Construction	Developer/ Contractor
9.28	Peat landslide and blasting	Visual peat monitoring to be undertaken following periods of blasting for any signs of potential instability. Infrastructure and peat areas within 500 m of the blasting location to be visited, with additional locations if relevant as recommended by the Environmental Clerk of Works. (Section 2.8 of the SEI Report)	Construction	Developer/ Contractor
9.29	Peat landslide and blasting	Blasting to be restricted in periods of significant wet weather, upon the advice of the blast engineer. (Section 2.9 of the SEI Report)	Construction	Developer/ Contractor

APPENDIX 1
HYDROLOGY AND PEAT FIGURES

APPENDIX 2
LANDSCAPE AND VISUAL IMPACT FIGURES