Energy and Climate Change Directorate
Energy Consents

T: 0131-244 1232
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The Scottish Government
Riaghaltas na h-Alba

Mr Peter Bruce
Ramboll
5th Floor
5 Castle Street
Edinburgh
EH2 3AH

By email to: Peter Bruce pbruce@ramboll.com

25 November 2020

Dear Mr Bruce

ELECTRICITY ACT 1989

THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017 (AS AMENDED)

SCREENING OPINION OF THE SCOTTISH MINISTERS

IN RESPECT OF A PROPOSED APPLICATION UNDER SECTION 36C OF THE ELECTRICITY ACT 1989 FOR FURTHER VARIATION APPLICATION FOR CHIRMORIE WIND FARM IN THE PLANNING AUTHORITY AREA OF SOUTH AYRSHIRE AND DUMFRIES AND GALLOWAY

Thank you for your letter dated 24 September 2020 requesting, on behalf of Chirmorie Wind Farm Ltd ("the Applicant"), a screening opinion in respect of a proposed variation application under Section 36c of the Electricity Act 1989 to further vary the existing consent granted under section 36 of said Act for Chirmorie Wind Farm, and as varied under Section 36c of said Act on 22 April 2020.

The proposed varied development is Chirmorie Wind Farm located approximately 5 km southwest of the village of Barrhill, in South Ayrshire and the proposed turbines and associated infrastructure are located within South Ayrshire Council area, and the access track and borrow pits are located within Dumfries and Galloway Council area ("planning authorities").

The scope of the proposed variation to the existing section 36 consent in respect of Chirmorie Wind Farm, which was granted by Scottish Ministers on 7 June 2019 and varied on 22 April 2020, includes:

- Variation 1 – increase the tip height of the 21 consented wind turbines from a maximum of 146.5m to a maximum of 149.9m;
- Variation 2 - Introduce a temporary construction phase access route from Barrhill (with no abnormal loads) along the C72 to site to facilitate the construction of the abutments of the consented bridge over the railway which bisects the wind farm site (essential works required for bridge construction), the construction of the platform of the sub-station and the initial section of access track, all consented and within the wind farm;
- Variation 3 – introduce an alternative route for access from the south west of Chirmorie wind farm for construction and for operational traffic (including associated infrastructure but excluding construction of the bridge components and sub-station preparation to be carried out using the access sought under variation 2). This route would largely follow the route consented for Stranoch wind farm, from the A77 near Innermessan by means of a public road (U90W) then access through Stranoch Estate;
- Variation 4 – introduce three borrow pits and a temporary construction compound (all consented for Stranoch Wind Farm) which are the closest to the proposed alternative access track.

The proposed variations require to be screened by the Scottish Ministers in accordance with regulation 7 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) ('the regulations'). Following a request for a screening opinion made under regulation 8(1), Scottish Ministers are required to adopt an opinion on whether the proposed variation is or is not EIA development.

The screening application email was accompanied by supporting documentation, which included a Chirmorie Wind Farm environmental screening assessment of the potential effects, Annex A: Site Layout and Location Plan and Comparative ZTVs, and additional information which comprised a review of traffic flows through Barrhill.

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017

The regulations set out (at 8(2)) the information that must accompany a request to the Scottish Ministers to adopt a screening opinion. Regulation 10 requires that the Scottish Ministers must seek that information if it is not included within the application documentation. Scottish Ministers consider the information included in the application letter and supporting documents is sufficient to meet the requirements set out in regulation 8(2), and that the submitted information has been compiled taking into account the selection criteria in schedule 3 of the regulations.

Statutory Consultation

Under regulation 8(5) of the regulations, Scottish Ministers are required to consult the planning authority within whose land the proposed application is situated. The appropriate planning authorities where consulted and South Ayrshire Council responded on 10 November 2020 advising that, in their view, the proposed further variation is not EIA development in so far as South Ayrshire Council are so able to determine. Dumfries and Galloway Council responded on 9 November 2020 advising that they consider that an EIA Report is not required in this case. A copy of the planning authorities responses are annexed to this screening opinion at (**Annex A**).

Consultation

NatureScot and Scottish Environment Protection Agency (SEPA) were also consulted in regard to environment effects that correlate with their areas of expertise. A copy of these responses is annexed to this screening opinion **(Annex A).**

Scottish Ministers' Considerations

EIA development is defined in the regulations, in respect of a variation application, as a proposed variation, which is either Schedule 1 development or Schedule 2 development likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

The proposed variation constitutes Schedule 2 development in terms of the regulations.

In adopting a screening opinion as to whether a Schedule 2 development is EIA development, the Scottish Ministers must in all cases take into account such of the selection criteria in Schedule 3 of the regulations, as are relevant to the proposed variation, and the available results of any relevant assessment.

Scottish Ministers have taken the selection criteria in Schedule 3 and all of the information submitted in respect of the screening request into account, and have taken account of the views of the planning authority, SEPA and NatureScot.

NatureScot advised that the proposed alternative access route (variation 3) may disturb hen harrier and result in the loss of habitat within the Glen App and Galloway Moors Special Protection Area (SPA). Scottish Ministers as Competent authority will be required to carry out an appropriate assessment in view of the site's conservation objectives for its qualifying interest. NatureScot further advised that the measures proposed to mitigate disturbance to hen harrier as a result of road widening and increased traffic along the U90 minor road appear to largely reflect what has been agreed for Stranoch Wind Farm, although, it is noted that they do not appear to include the commitment to avoiding heavy machinery and turbine delivery during the hen harrier breeding season given for Stranoch. However additional measures *may* also be required; the submitted Habitats Regulations Appraisal (HRA) scopes both the spine track and link track out of the assessment, as they are identified as being over 2km from the SPA. However, NatureScot consider this does not appear to be

correct (for example, the section of track near Stab Hill is around 750m from the SPA). An assessment of the implications of all elements of the proposal within connectivity distance of the SPA will be required.

Scottish Ministers agree with the planning authority's view, and adopt the opinion that **the proposal does not constitute EIA development and that any application submitted for this development does not require to be accompanied by an EIA report.** Scottish Ministers would expect the applicant to take account of the advice of all the consultees contained in the responses at **Annex A.**

In accordance with regulation 7(2), the following written statement with reference to the relevant selection criteria within Schedule 3 of the regulations accompanies this opinion. In accordance with the regulations, a copy of the screening opinion has been sent to the planning authorities.

The Scottish Ministers have adopted this opinion on the basis that all information and proposed mitigation measures set out in the:

- Consultee responses;
- Chirmorie Wind Farm Environmental Statement 2015;
- Stranoch 2 Wind Farm Environmental Report 2018;
- Variation Application For Chirmorie Wind Farm Environmental Impact Assessment Screening March 2019; and
- Chirmorie Wind Farm Application for a Further Section 36 Variation of Section 36 Consent – request for Screening Opinion – Non EIA September 2020.

Any future application submitted to varied the consented development must be accompanied by sufficient information and supporting documentation to allow Scottish Ministers and consultees to fully assess the application and to allow Scottish Ministers to reach a determination. The supporting information shall include but not limited to an Environmental Report assessing the effects of the proposed varied development on all the relevant environmental matters.

Written Statement

Characteristics of Development

The proposed variation constitutes an increase of 3.4m in the height of the 21 wind turbines and an increase in the blade length of approximately 11m, the introduction of a temporary route from Barrhill to facilitate essential works required for bridge construction, the introduction of an alternative access route and three borrow pits and a temporary construction compound.

The proposed varied development does not change the layout or location of the consented wind turbines. It is considered unlikely that the potential cumulative impacts with other existing and approved developments will not produce a significant overall change in effect. The use of resources, production of waste, pollution risk, risk of accidents or risk to human health will not increase significantly as result of the proposed varied development. These matters would require to be subject to mitigation measures as set out in the existing consented development.

The Location of the Development

The land and the location of the proposed varied development is currently approved for wind farm development. The proposed varied development would not change the effect of the development on the relative abundance, availability, quality and regenerative capacity of natural resources in the area and its underground, or on the absorption capacity of the natural environment.

Characteristics of the Potential Impact

The magnitude and spatial extent of the impact, the nature of the impact (including transboundary), and the cumulative effect on environmental factors including biodiversity, land, soil, water, climate, cultural heritage, landscape, and population and human health of the proposed varied development are considered not to be significant.

The table attached at Annex B provides further details on the selection criteria within Schedule 3 of the regulations and whether or not potential effects are likely to be significant.

Taking account of the above, the proposed variation will not have a likely significant effect on the factors specified in regulation 4(3) of the regulations.

This screening opinion does not constitute pre–application advice, and is provided without prejudice to the assessment of any future application under section 36c of the Electricity Act 1989 and section 57 of the Town and Country Planning (Scotland) Act 1997.

Yours sincerely,

Theresa McInnes
A member of the staff of the Scottish Government

cc South Ayrshire Council
cc Dumfries and Galloway Council
cc Nature Scot
cc SEPA

ANNEX A

Place Directorate

Service Lead – Planning and Building Standards: Julie Nicol

Planning Service, County Buildings, Wellington Square, Ayr, KA7 1DR
Tel: (01292) 616683
Email: alan.edgar@south-ayrshire.gov.uk
Our Ref: 19/00564/DEEM
Date: 10 November 2020

Energy Consents Unit,
FAO Theresa McInnes, Consents Manager,
Unit 5 Atlantic Quay,
150 Broomie Law,
Glasgow G2 8LU

By Email

Dear Madam

APPLICATION REF: **19/00564/DEEM**
SITE ADDRESS: **Proposed Wind Farm Chirmorie C72 From Gowlands Terrace Barrhill To Council Boundary South Of Chirmorie South From Barrhill Barrhill South Ayrshire**

PROPOSAL: **Screening Request In Relation To Forthcoming Application under section 36C of the Electricity Act 1989 requesting Scottish Ministers vary the existing section 36 consent to construct and operate Chirmorie wind generating station – 2nd Variation**

We refer to your email dated 30 September 2020 requesting South Ayrshire Council's views on the Screening Opinion request submitted by Ramboll UK on behalf of Chirmorie Wind Farm Ltd on 24 September 2020. The following should be considered as South Ayrshire Council's view on the Screening Opinion Request for the purpose of Regulation 8 of the Electricity Works (EIA) (Scotland) Regulations 2017.

CONCLUSION

It is the view of South Ayrshire Council that the proposed further variation is not EIA development in so far as South Ayrshire Council are so able to determine.

IMPORTANT NOTES ON OUR RESPONSE

For the purposes of clarity we would ask you to note that this response relates to those parts of the proposed varied Chirmorie Wind Farm that lie within the administrative area of South Ayrshire Council or which are considered to impact on the interests of this Authority's area. We note that you have consulted Dumfries and Galloway Council regarding those elements of the proposed varied development that lie within their administrative boundary. We would also ask you to note that our response provides comments on the environmental effects of the varied development that are within the competency of the Planning Authority to comment upon. We note that you have consulted with Nature Scotland and SEPA in regard to environment effects that correlate with their areas of competency. Where we have not provided comments on particular environmental effects, this is noted in our response.

BACKGROUND

The Chirmorie Wind Farm was approved by Scottish Ministers under Section 36 of the Electricity Act 1989 on 16 March 2018, together with a Direction under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997 (as amended) to construct and operate a 21 turbine wind farm at Chirmorie Farm, near Barrhill. An application to vary the consent was approved by Scottish Ministers on 22 April 2020. The current Screening Opinion request (dated 24/09/2020) has been submitted in relation to a proposed further variation of the original consent to permit the following further amendments:

Variation 1 - increasing the tip height of the 21 consented wind turbines from 146.5 m to 149.9 m (3.4 m) and increasing the blade length from an indicative length of 57 m to an indicative length of 68 m;

Variation 2 - A temporary construction phase access route from Barrhill via the C72 is sought to facilitate construction of the consented bridge over the Stranraer/Ayr railway line located within the approximate centre of the wind farm site. The variation sought will not result in any change to the consented track alignment or construction details but only to the timing and use of the track. This access will only be used at the start of the construction phase to facilitate construction of the short section of access track to build the eastern abutment of the bridge and the consented substation platform. The track will be used by HGV traffic however no abnormal loads will use this route. Once the bridge is completed, this access will not be used for the remainder of the construction phase. The access point and track would however be retained for the operational phase for use by non-HGV traffic only. The use of the access route will result in increased HGV and non-HGV traffic passing through the village of Barrhill. Additional information on traffic volumes, peak flows and type of traffic was provided on 20 October 2020 by the applicant. This indicates that total vehicle movements will be an average of 6 per day over a three month period. Of these, an average 2 per day will be HGV with the remainder being car and light goods vehicles. Vehicle movements will be spread evenly over the three month duration of the works.

Variation 3 - introducing an alternative route for access from the south west of the wind farm for construction and operational traffic for Chirmorie wind farm (including associated infrastructure and excluding construction of the proposed bridge piers and relevant ground works) which would largely follow the route consented for Stranoch Wind Farm, from the A77 near Innermessan, by means of a public road then an access track through Stranoch estate to Chirmorie wind farm7; **and**

Variation 4 - introducing three borrow pits and temporary construction compound (consented for Stranoch Wind Farm) which are closest to the proposed alternative access track.

CONSIDERATION OF ENVIRONMENTAL EFFECTS

Variation 1 – changes to turbine dimensions

Landscape and Visual Amenity:- The location of the turbines will be the same as for the consented scheme. The most notable change in circumstances since the original EIA is that the Altercannoch wind farm, which was at scoping stage in 2015, was refused permission (on appeal). Having regard to the comparative ZTV produced for this Screening Opinion request it is noted that the pattern of visibility closely matches the consented scheme across the study area. Across the selected viewpoints there will be no changes in the number of hubs or blade tips visible. The height increase extends the visibility in isolated locations by up to 150m. Some margins of scattered additional visibility will occur to fringe areas including within the Kilquhockadale Forest, parts of Eldrig Moss and a small area north of Sand End.

The potential additional landscape and visual impact effects are considered to be marginal and not of a magnitude that requires assessment through EIA. The additional effects can be adequately assessed through the submission of a Landscape and Visual Impact Assessment.

Cultural Heritage:- As the wind turbine locations are not altered, no new or additional direct effects are predicted. The original EIA predicted moderate adverse indirect effects on the setting of two scheduled monuments (Cairn Kennedy and Markdhu, which are located 2km south of the site). The magnitude of impact will not increase as the increase in blade tip height is anticipated to be imperceptible when viewed from the monuments.

The potential cultural heritage effects are considered to be marginal and not of a magnitude that requires assessment through EIA.

Air Quality:- No increase in the significance of air quality impacts (as stated in the EIA for the original wind farm in 2015) is anticipated as a result of the proposed changes to the turbines and all mitigation measures (Annex B, Table B1) will be adhered to. Additionally, the increased rotor diameter would increase the energy generation potential and efficiency of the site improving the total carbon dioxide

The potential air quality effects are considered to be marginal and not of a magnitude that requires assessment through EIA.

Noise:- The EIA for the consented wind farm concluded that construction noise will have negligible impact on the nearest residential noise receptors. Conditions setting noise limits have been imposed on the consented wind farm and the Ramboll report concludes that these can be met under the modified scheme.

The potential noise effects are considered to be marginal and not of a magnitude that requires assessment through EIA. This issue can be adequately assessed through the submission of an updated noise impact assessment.

Land Use & Forestry:- The site comprises undulating upland and rough grazing. No change to the effects on land use are predicted as a result of the turbine modifications.

The potential land use and forestry effects are considered to be marginal and not of a magnitude that requires assessment through EIA.

Population and Human Health:- The area where consented wind farm is located is generally remote and the density of dwellings low. The main population centres surrounding the area are Barrhill, Pinmore, Pinwherry, Colmonell, Ballantrae, Cairnryan and New Luce. No increase in the significance of effects to population and human health are anticipated as the proposed modifications would not result in any change in the way the Proposed (varied) Development would interact with socioeconomic receptors. All mitigation measures identified in the CWF ES 2015 will be adhered to.

The potential population & human health effects are considered to be marginal and not of a magnitude that requires assessment through EIA.

Shadow Flicker:- An assessment of shadow flicker potential was undertaken for all properties within ten rotor diameters of the nearest turbines. Chirmorie farm house is the nearest inhabited dwelling. The dwelling at Chirmorie farm will not be occupied and alternative accommodation is to be provided for the occupants. The report prepared by Ramboll identifies that one additional turbine will cause shadow flicker affecting Chirmorie farm house. However in the worst case scenario, this is less than 1 hour in a day and the modifications are not considered to have significant impact.

Conclusions Variation 1

The potential additional landscape and visual impact effects are considered to be marginal and not of a magnitude that requires assessment through EIA. The additional effects can be adequately assessed through the submission of a Landscape and Visual Impact Assessment.

Note

The potential impacts on geology & soils, water resources & flood risk and risk from major accidents are not addressed in our assessment and advice of SEPA and Nature Scotland should be sought.

Variation 2 - introducing a temporary construction phase access route from Barrhill

The proposed variation will result in additional vehicle movements through Barrhill village. The increase in traffic is statistically large for HGV traffic, however this is due to the very low levels of existing HGV movements on the network. The actual volume of HGV traffic is not significant. A Construction Traffic Management Plan (CTMP) would be put in place to manage traffic on the network which will also involve setting up an 'Access Liaison Group' which will include the local Community Councils and will inform the local community of the construction programme and provide a contact for any issues or concerns that may arise during the construction period. The volume of vehicle movements is not significant in the context of EIA in terms of noise, disturbance, local air quality and convenience of road users.

Conclusions Variation 2

The potential impacts on the surrounding road network and residential environment from increased HGV and other traffic are not considered to be of such significance as to merit assessment through EIA. The proposed variation can be adequately assessed through a Transport Statement.

Variation 3 – Alternative Construction Traffic Route

The environmental impact of the majority of the alternative construction traffic route has previously been assessed through the Stranoch Wind Farm (Stranoch 1 and 2) and the Chirmorie Wind Farm. The Stranoch Wind Farm falls within Dumfries and Galloway Council area and that part of variation 3 is not considered further in this response. Approximately 1/3 of the new section of track proposed as part of variation 3 lies within South Ayrshire. The proposed new section of track will be in a remote location and not readily viewed from any public vantage point. The nearest public viewpoints are the unclassified public road between New Luce and Barrhill and the Ayr to Stranraer railway. The applicant's supporting information states that the track will not be visible from the public road and only visible over a 900 metre stretch of the railway. The new section of track is characteristic of the Plateau Moorland with Forestry and Wind Farms *landscape character type* and it is not predicted that there would be significant effects to the landscape fabric, character, views and visual amenity from this aspect of the proposed variation. No adverse impact on known heritage assets are predicted and mitigation will be in place should previously unrecorded archaeology be discovered during excavation of the additional track. It is noted that the link will disturb areas of peat greater than 0.5m depth, particularly within the vicinity of the Water of Luce. The impact on peat is not considered significant with implementation of mitigation measures. The potential pollution risk is however high due to the proximity of the peat to the watercourse.

Conclusions Variation 3

Having regard to the minor scale of the proposal it is not considered that this issue requires to be assessed through EIA. The conclusions on the impacts on the ecology of the site and the water environment should be verified with Nature Scotland and SEPA.

Note

The potential impacts on geology & soils, water resources & flood risk and ecology are not considered in our response and the advice of SEPA and Nature Scotland should be sought.

Variation 4 – borrow pits

The location of the proposed borrow pits lies within Dumfries and Galloway and this aspect of the proposed variation is not considered in this response.

I trust the foregoing will be of assistance.

Yours faithfully

Mr Alan Edgar
Supervisory Planner, Priority Projects

Your Ref:

Our Ref: 20/1764/ENQ

Date: 9 November 2020

Dumfries & Galloway Council
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PROPOSAL: **CONSULTATION FROM SCOTTISH MINISTERS IN RESPECT OF SCREENING OPINION REQUEST FOR PROPOSED VARIATION OF EXISTING CONSENT UNDER SECTON 36C OF THE ELECTRICITY ACT (TO UTILISE THE SAME CONSTRCUTION TRAFFIC ROUTE WITHIN DUMFRIES AND GALLOWAY AS THAT PROPOSED FOR STRANOCH 1/STRANOCH 2 WINDFARM DEVELOPMENT)**

LOCATION: **Chirmorie Wind Farm, South Ayrshire**

Dear Sir/Madam

I refer to the above noted development, submitted to the Council under the provisions of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

The requirement for EIA is dependent on whether or not the Scottish Ministers considers the proposed development is likely to have significant effects on the environment by virtue of factors such as its nature, size or location, taking into account the selection criteria in Schedule 3 of the Regulations and the available results of any relevant assessment.

Considering the information submitted with your request, and having regards to the selection criteria contained in Schedule 3 of the regulations relating to the characteristics of the development, the location of the development and the characteristics of the potential impact as well as any proposed mitigation measures, it is the view of the Council as planning authority that the proposed development unlikely to have significant impacts on the environment and will therefore **not**, in the Councils

opinion, require EIA.

The reasons are as follows:

Characteristics of the Development:
a) *Scale of the development* - The proposed development will be located in a predominantly rural area, with the are of proposed link track situated in an area that is both remote and rural.
b) *Use of natural resources* - The construction of the proposed development will require the use of fuels and energy. Utility services will be required to in order to support its operation.
c) *Production of waste* - Wastes are likely to be produced during construction and operation.
d) *Pollution and nuisances* - Potential for dust during the construction phase, along with vibration and light pollution. Potential for fuel spillage; potential for watercourses to be contaminated by soil and liquids.
e) *Risk of major accidents and/or disasters which are relevant to the development concerned, including those caused by climate change, in accordance with scientific knowledge* - There will always be risks as a result of construction and operation works.
f) *Risks to human health* – Storage of fuels.

Location of Development:
a) *Existing land use* – Remote and or rural; agricultural area of land.
b) *Relative abundance, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its surround* – NA.
c) *Absorption capacity of the natural environment* – No noted sensitive/scheduled or protected areas nearby.

Characteristics of the potential impact:
The likely significant effects of the development as considered above has taken the following into account:
(a) the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
(b) the nature of the impact;
(c) the transboundary nature of the impact;
(d) the intensity and complexity of the impact;
(e) the probability of the impact;
(f) the expected onset, duration, frequency and reversibility of the impact;
(g) the cumulation of the impact with the impact of other existing and/or approved development;
(h) the possibility of effectively reducing the impact.

Mitigation:
Mitigation measures shall include:

- Development would be sited and designed carefully around environmental and technical considerations.

In summary, following consideration of the proposal against the relevant Schedule 3 criteria, it is considered that an Environmental Impact Assessment is **not required** in this case.

Should you require any further information please contact Chris McTeir on the above number.

Yours faithfully,

Robert Duncan
Team Leader (Major Applications)

NatureScot
Scotland's Nature Agency
Buidheann Nàdair na h-Alba

FAO Theresa McInnes
Consents Manager
Energy Consents Unit
Directorate for Energy and Climate Change
Scottish Government

22 October 2020

Our ref: CNS/REN/WF/SA – Chirmorie – CEA160726 - A3320813

Dear Ms McInnes

THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017
SCREENING CONSULTATION
PROPOSED APPLICATION UNDER SECTION 36C OF THE ELECTRICITY ACT 1989 TO FURTHER VARY THE EXISTING SECTION 36 CONSENT AND DEEMED PLANNING PERMISSION TO CONSTRUCT AND OPERATE THE CHIRMORIE WIND FARM, IN THE PLANNING AUTHORITY AREA OF SOUTH AYRSHIRE COUNCIL (ECU00002150)

Thank you for your consultation dated 1 October 2020 regarding the further Section 36C variation application for Chirmorie Wind Farm, which is within the administrative boundary of South Ayrshire Council, approximately 7km south west of Barrhill. Elements of this further variation would also be within the administrative boundary of Dumfries and Galloway Council.

Background

In March 2018 Chirmorie Wind Farm was granted consent under Section 36 of the Electricity Act for 21 turbines with a maximum tip height of 146.5m with associated tracks and infrastructure.

On 7 June 2019 the applicant submitted an application to Scottish Ministers under section 36 C of the Electricity Act 1989 to vary the existing section 36 consent. We provided advice on this application in our letter dated 24 July 2019 and the variations were consented on the 22 April 2020.

The applicant (Chirmorie Wind Farm Ltd) is now seeking a further variation of consent under Section 36C of the Electricity Act 1989. We understand that, in summary, this further variation includes the following four elements (variation 1-4) as detailed in the letter from Ramboll dated 24 September 2020:

- Increase the tip height of the 21 consented turbines from a maximum of 146.5m to a maximum of 149.9m (variation 1)
- Introduce a temporary construction phase access route from Barrhill along the C72 to facilitate aspects of the consented development (variation 2);
- Introduce an alternative route for access from the south west for construction and for operational traffic. This route would largely follow the route consented for Stranoch wind farm, by means of a public road from the A77 (U90W) and access track through Stranoch Estate, Lagafater to Chirmorie wind farm (variation 3); and
- Introduce three borrow pits and a temporary construction compound (all consented for Stranoch wind farm) which are the closest to the proposed alternative access track (variation 4).

NatureScot Advice

In providing the following comments, our role is to advise whether the proposal is likely to have any significant effects on the environment in order to inform the consenting authority's decision as to whether an Environmental Impact Assessment (EIA) is required. The decision on whether an EIA is required is however for the consenting authority to make.

Glen App and Galloway Moors SPA

- The proposed alternative access route (variation 3) may disturb hen harrier and result in the loss of habitat within the SPA. **Therefore in our view, this aspect of the proposed variation is likely to have a significant effect on the breeding hen harrier interests of Glen App and Galloway Moors SPA. Consequently, Scottish Ministers, as competent authority, will be required to carry out an appropriate assessment in view of the site's conservation objectives for its qualifying interest.**

We further advise that:

- Provided there is no significant habitat loss within the SPA as a result of the proposed variation additional to that assessed for the Stranoch Wind Farm development, then it is unlikely that habitat loss from widening/upgrading the U90W road would result in an adverse effect on the integrity of the Glen App and Galloway Moors SPA.

- The measures proposed to mitigate disturbance to hen harrier as a result of road widening and increased traffic along the U90 minor road appear to largely reflect what has been agreed for Strannoch Wind Farm (although we note that they do not appear to include the commitment to avoiding heavy machinery and turbine delivery during the hen harrier breeding season given for Stranoch). However additional measures *may* also be required; the submitted Habitats Regulations Appraisal (HRA) scopes both the spine track and link track out of the assessment, as they are identified as being over 2km from the SPA. However, this does not appear to be correct (for example, the section of track near Stab Hill is around 750m from the SPA). An assessment of the implications of all elements of the proposal within connectivity distance of the SPA will be required.

Peatland habitats

- Much of the wind farm link track route is marked as Class “1" peatland on the SNH Carbon and Peatland Map 2016 and peat depth surveys of the proposed link route identified significant areas of deep peat in the vicinity of the Cross Water of Luce that the link route would traverse. Class “1” peatlands are nationally important carbon-rich soils, deep peat and priority habitat and are likely to be of high conservation value (see the following link for further details: https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/). Full details of how any significant effects on the qualities of this area are to be avoided through siting, design or other mitigation will be required, in accordance with Scottish Planning Policy.

Protected Species

Any application for this proposal will require to consider the impacts of the development on protected species. Should ECU determine that an EIA is not required, we consider that this information could be provided in the form of a targeted environmental report

Concluding remarks

I hope you find these comments useful in your consideration of this screening request but should you need any further information or advice from NatureScot, please do not hesitate to contact me at Natalie.Ward@nature.scot

Please note that the advice provided in letter is given without prejudice to a full and detailed consideration of the impacts of the proposal if submitted for formal consultation as part of the EIA. We understand that the decision as to whether or not an EIA should be carried out is a matter for the Competent Authority taking into account wider interests than our own.

Finally, this advice is given by NatureScot, the operating name of Scottish Natural Heritage.

Yours sincerely,

Natalie Ward

Area Officer / Strathclyde & Ayrshire

Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Our ref: PCS/173464
Your ref:

If emailing mark for:
Judith Montford

22 October 2020

Theresa McInnes
Energy Consents Unit
Scottish Government
Unit 5 Atlantic Quay
150 Broomie Law
Glasgow
G2 8LU

By email only to: Theresa.McInnes@gov.scot

Dear Ms McInnes

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
Case Reference: EC00001862
REQUEST FOR SCREENING OPINION. PROPOSED APPLICATION UNDER SECTION 36C OF THE ELECTRICITY ACT 1989 TO FURTHER VARY THE EXISTING SECTION 36 CONSENT AND DEEMED PLANNING PERMISSION TO CONSTRUCT AND OPERATE
CHIRMORIE WIND FARM

Thank you for consulting SEPA on the screening opinion for the above development proposal by your email received on 14 October 2020. We would welcome engagement with the applicant at an early stage to discuss any of the issues raised in this letter.

Advice to the planning authority

We understand further variations to the Chirmorie Wind Farm section 36 consent are being sought as these (4 variations listed in the submissions by Rambol), were not assessed as part of the original section 36 application for the Chirmorie Wind Farm in 2015 (ECU00002071). We would like to highlight that irrespective of whether an EIA is required or not for this proposal, we consider that the following key issues must be addressed (as applicable) in the Environmental Impact Assessment process. To **avoid delay and potential objection,** the information outlined below and in the attached appendix must be submitted in support of the application.

a) Map and assessment of all engineering activities in or impacting on the water environment including proposed buffers, details of any flood risk assessment and details of any related CAR applications.

b) Map and assessment of impacts upon Groundwater Dependent Terrestrial Ecosystems and buffers.

c) Map and assessment of impacts upon groundwater abstractions and buffers.

d) Peat depth survey and table detailing re-use proposals.

e) Map and table detailing forest removal.

f) Map and site layout of borrow pits.

g) Schedule of mitigation including pollution prevention measures.

h) Borrow Pit Site Management Plan of pollution prevention measures.

i) Map of proposed waste water drainage layout.

j) Map of proposed surface water drainage layout.

k) Map of proposed water abstractions including details of the proposed operating regime.

l) Decommissioning statement.

Further details on these information requirements and the form in which they must be submitted can be found in the attached appendix.

Regulatory advice for the applicant

1. Regulatory requirements

1.1 Authorisation is required under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) to carry out engineering works in or in the vicinity of inland surface waters (other than groundwater) or wetlands. Inland water means all standing or flowing water on the surface of the land (e.g. rivers, lochs, canals, reservoirs).

1.2 Management of surplus peat or soils may require an exemption under The Waste Management Licensing (Scotland) Regulations 2011. Proposed crushing or screening will require a permit under The Pollution Prevention and Control (Scotland) Regulations 2012. Consider if other environmental licences may be required for any installations or processes.

1.3 A Controlled Activities Regulations (CAR) construction site licence will be required for management of surface water run-off from a construction site, including access tracks, which:

- is more than 4 hectares,
- is in excess of 5km, or
- includes an area of more than 1 hectare or length of more than 500m on ground with a slope in excess of 25˚

See SEPA's Sector Specific Guidance: Construction Sites (WAT-SG-75) for details. Site design may be affected by pollution prevention requirements and hence we strongly encourage the applicant to engage in pre-CAR application discussions with a member of the regulatory services team in your local SEPA office.

1.4 Below these thresholds you will need to comply with CAR General Binding Rule 10 which requires, amongst other things, that all reasonable steps must be taken to ensure that the discharge does not result in pollution of the water environment. The detail of how this is achieved may be required through a planning condition.

1.5 Details of regulatory requirements and good practice advice for the applicant can be found on the Regulations section of our website. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the regulatory services team in your local SEPA office at: SWS@sepa.org.uk

If you have any queries relating to this letter, please contact me e-mail at planning.sw@sepa.org.uk

Yours sincerely

Judith Montford
Senior Planning Officer
Planning Service

Appendix 1: Detailed scoping requirements

This appendix sets out our scoping information requirements. There may be opportunities to scope out some of the issues below depending on the site. Evidence must be provided in the submission to support why an issue is not relevant for this site in order **to avoid delay and potential objection**.

If there is a delay between scoping and the submission of the application then please refer to our website for our latest information requirements as they are regularly updated; current best practice must be followed.

We would welcome the opportunity to comment on the draft submission. As we can process files of a maximum size of only 25MB the submission must be divided into appropriately named sections of less than 25MB each.

1. Site layout

1.1 All maps must be based on an adequate scale with which to assess the information. This could range from OS 1: 10,000 to a more detailed scale in more sensitive locations. Each of the maps below must detail all proposed upgraded, temporary and permanent site infrastructure. This includes all tracks, excavations, buildings, borrow pits, pipelines, cabling, site compounds, laydown areas, storage areas and any other built elements. Existing built infrastructure must be re-used or upgraded wherever possible. The layout should be designed to minimise the extent of new works on previously undisturbed ground. For example, a layout which makes use of lots of spurs or loops is unlikely to be acceptable. Cabling must be laid in ground already disturbed such as verges. A comparison of the environmental effects of alternative locations of infrastructure elements, such as tracks, may be required.

2. Engineering activities which may have adverse effects on the water environment

2.1 The site layout must be designed to avoid impacts upon the water environment. Where activities such as watercourse crossings, watercourse diversions or other engineering activities in or impacting on the water environment cannot be avoided then the submission must include justification of this and a map showing:

a) All proposed temporary or permanent infrastructure overlain with all lochs and watercourses.

b) A minimum buffer of 50m around each loch or watercourse. If this minimum buffer cannot be achieved each breach must be numbered on a plan with an associated photograph of the location, dimensions of the loch or watercourse and drawings of what is proposed in terms of engineering works.

c) Detailed layout of all proposed mitigation including all cut off drains, location, number and size of settlement ponds.

2.2 If water abstractions or dewatering are proposed, a table of volumes and timings of groundwater abstractions and related mitigation measures must be provided.

2.3 Further advice and our best practice guidance are available within the water engineering section of our website. Guidance on the design of water crossings can be found in our Construction of River Crossings Good Practice Guide.

2.4 Refer to Appendix 2 of our Standing Advice for advice on flood risk. Watercourse crossings must be designed to accommodate the 0.5% Annual Exceedance Probability (AEP) flows, or information provided to justify smaller structures. If it is thought that the development

could result in an increased risk of flooding to a nearby receptor then a Flood Risk Assessment must be submitted in support of the planning application. Our Technical flood risk guidance for stakeholders outlines the information we require to be submitted as part of a Flood Risk Assessment. Please also refer to Controlled Activities Regulations (CAR) Flood Risk Standing Advice for Engineering, Discharge and Impoundment Activities.

3. Disturbance and re-use of excavated peat and other carbon rich soils

3.1 Scottish Planning Policy states (Paragraph 205) that "Where peat and other carbon rich soils are present, applicants must assess the likely effects of development on carbon dioxide (CO_2) emissions. Where peatland is drained or otherwise disturbed, there is liable to be a release of CO_2 to the atmosphere. Developments must aim to minimise this release."

3.2 The planning submission must a) demonstrate how the layout has been designed to minimise disturbance of peat and consequential release of CO_2 and b) outline the preventative/mitigation measures to avoid significant drying or oxidation of peat through, for example, the construction of access tracks, drainage channels, cable trenches, or the storage and re-use of excavated peat. There is often less environmental impact from localised temporary storage and reuse rather than movement to large central peat storage areas.

3.3 The submission must include:

a) A detailed map of peat depths (this must be to full depth and follow the survey requirement of the Scottish Government's Guidance on Developments on Peatland - Peatland Survey (2017)) with all the built elements (including peat storage areas) overlain to demonstrate how the development avoids areas of deep peat and other sensitive receptors such as Groundwater Dependent Terrestrial Ecosystems.

b) A table which details the quantities of acrotelmic, catotelmic and amorphous peat which will be excavated for each element and where it will be re-used during reinstatement. Details of the proposed widths and depths of peat to be re-used and how it will be kept wet permanently must be included.

3.4 To avoid delay and potential objection proposals must be in accordance with Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste and our Developments on Peat and Off-Site uses of Waste Peat.

3.5 Dependent upon the volumes of peat likely to be encountered and the scale of the development, applicants must consider whether a full Peat Management Plan (as detailed in the above guidance) is required or whether the above information would be best submitted as part of the schedule of mitigation.

3.6 Please note we do not validate carbon balance assessments except where requested to by Scottish Government in exceptional circumstances. Our advice on the minimisation of peat disturbance and peatland restoration may need to be taken into account when you consider such assessments.

4. Disruption to Groundwater Dependent Terrestrial Ecosystems (GWDTE)

4.1 GWDTE are protected under the Water Framework Directive and therefore the layout and design of the development must avoid impact on such areas. The following information must be included in the submission:

a) A map demonstrating that all GWDTE are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the

distances require it.

b) If the minimum buffers above cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. We are likely to seek conditions securing appropriate mitigation for all GWDTE affected.

4.2 Please refer to Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems for further advice and the minimum information we require to be submitted.

5. Existing groundwater abstractions

5.1 Excavations and other construction works can disrupt groundwater flow and impact on existing groundwater abstractions. The submission must include:

a) A map demonstrating that all existing groundwater abstractions are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.

b) If the minimum buffers above cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. We are likely to seek conditions securing appropriate mitigation for all existing groundwater abstractions affected.

5.2 Please refer to Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems for further advice on the minimum information we require to be submitted.

6. Forest removal and forest waste

6.1 Key holing must be used wherever possible as large scale felling can result in large amounts of waste material and in a peak release of nutrients which can affect local water quality. The supporting information should refer to the current Forest Plan if one exists and measures should comply with the Plan where possible.

6.2 Clear felling may be acceptable only in cases where planting took place on deep peat and it is proposed through a Habitat Management Plan to reinstate peat-forming habitats. The submission must include:

a) A map demarcating the areas to be subject to different felling techniques.

b) Photography of general timber condition in each of these areas.

c) A table of approximate volumes of timber which will be removed from site and volumes, sizes of chips or brash and depths that will be re-used on site.

d) A plan showing how and where any timber residues will be re-used for ecological benefit within that area, supported by a Habitat Management Plan. Further guidance on this can be found in Use of Trees Cleared to Facilitate Development on Afforested Land – Joint Guidance from SEPA, SNH and FCS.

7. Borrow pits

7.1 Scottish Planning Policy states (Paragraph 243) that “Borrow pits should only be permitted if there are significant environmental or economic benefits compared to obtaining material from local quarries, they are time-limited; tied to a particular project and appropriate reclamation measures are in place.” The submission must provide sufficient information to

address this policy statement.

7.2 In accordance with Paragraphs 52 to 57 of Planning Advice Note 50 Controlling the Environmental Effects of Surface Mineral Workings (PAN 50) a Site Management Plan should be submitted in support of any application. The following information should also be submitted for each borrow pit:

a) A map showing the location, size, depths and dimensions.

b) A map showing any stocks of rock, overburden, soils and temporary and permanent infrastructure including tracks, buildings, oil storage, pipes and drainage, overlain with all lochs and watercourses to a distance of 250 metres. You need to demonstrate that a site specific proportionate buffer can be achieved. On this map, a site-specific buffer must be drawn around each loch or watercourse proportionate to the depth of excavations and at least 10m from access tracks. If this minimum buffer cannot be achieved each breach must be numbered on a plan with an associated photograph of the location, dimensions of the loch or watercourse, drawings of what is proposed in terms of engineering works.

c) You need to provide a justification for the proposed location of borrow pits and evidence of the suitability of the material to be excavated for the proposed use, including any risk of pollution caused by degradation of the rock.

d) A ground investigation report giving existing seasonally highest water table including sections showing the maximum area, depth and profile of working in relation to the water table.

e) A site map showing cut-off drains, silt management devices and settlement lagoons to manage surface water and dewatering discharge. Cut-off drains must be installed to maximise diversion of water from entering quarry works.

f) A site map showing proposed water abstractions with details of the volumes and timings of abstractions.

g) A site map showing the location of pollution prevention measures such as spill kits, oil interceptors, drainage associated with welfare facilities, recycling and bin storage and vehicle washing areas. The drawing notes should include a commitment to check these daily.

h) A site map showing where soils and overburden will be stored including details of the heights and dimensions of each store, how long the material will be stored for and how soils will be kept fit for restoration purposes. Where the development will result in the disturbance of peat or other carbon rich soils then the submission must also include a detailed map of peat depths (this must be to full depth and follow the survey requirement of the Scottish Government's Guidance on Developments on Peatland - Peatland Survey (2017)) with all the built elements and excavation areas overlain so it can clearly be seen how the development minimises disturbance of peat and the consequential release of CO_2.

i) Sections and plans detailing how restoration will be progressed including the phasing, profiles, depths and types of material to be used.

j) Details of how the rock will be processed in order to produce a grade of rock that will not cause siltation problems during its end use on tracks, trenches and other hardstanding.

8. Pollution prevention and environmental management

8.1 One of our key interests in relation to developments is pollution prevention measures during the periods of construction, operation, maintenance, demolition and restoration. A schedule of mitigation supported by the above site specific maps and plans must be submitted. These must include reference to best practice pollution prevention and construction techniques (for example, limiting the maximum area to be stripped of soils at any one time) and regulatory requirements. They should set out the daily responsibilities of ECOWs, how site inspections will be recorded and acted upon and proposals for a planning monitoring enforcement officer. Please refer to Guidance for Pollution Prevention (GPPs).

9. Life extension, repowering and decommissioning

9.1 Proposals for life extension, repowering and/or decommissioning must demonstrate accordance with SEPA Guidance on the life extension and decommissioning of onshore wind farms. Table 1 of the guidance provides a hierarchical framework of environmental impact based upon the principles of sustainable resource use, effective mitigation of environmental risk (including climate change) and optimisation of long term ecological restoration. The submission must demonstrate how the hierarchy of environmental impact has been applied, within the context of latest knowledge and best practice, including justification for not selecting lower impact options when life extension is not proposed.

9.2 The submission needs to demonstrate that there will be no discarding of materials that are likely to be classified as waste as any such proposals would be unacceptable under waste management licensing. Further guidance on this may be found in the document Is it waste - Understanding the definition of waste.

ANNEX B

Environmental Topic	Baseline Description (Environmental Sensitivity)	Appraisal and Potential for Significant[1] Environmental Effects	Are Effects likely to be significant? Yes/No? Significance considered in terms of the extent, transboundary nature, magnitude and complexity, probability, duration, frequency and reversibilyt of any impact(s).
Biodiversity (non - avian ecology)	<u>Variation 1 & 2</u> *Flora* Site walkovers and surveys completed for CWF ES (2015) indicated that much of the peatland habitat (an Annex 1 habitat type and UK Biodiversity Action Plan (BAP) priority Habitat) on site and immediately adjacent to it had been modified to varying degrees by agricultural activities including drainage as well as grazing by sheep and cattle. Two Groundwater Dependant Terrestrial Ecosystems (GWDTE) were identified within the site boundary: - M23b: *Juncus effusus/acutiflorus – Galium palustre* rush pasture – Juncus effusus sub-community. High dependency; and - MG10a: *Juncus effusus – Holcus lanatus* rush pasture typical sub-community. Moderate dependency. The Laggish Burn drains much of the northern catchment of the site and is fed by a network of small burns and grips dug across the northern area of the site. The Cross Water of Luce in the south drains the southern catchment and is	<u>Variation 1 & 2</u> The CWF ES 2015 found that there would be no direct or indirect effects on any site designated for its international or national nature conservation value. This conclusion remains valid taking the variations into account. The residual permanent effects on habitats identified in the CWF ES 2015 were found to be minor to moderate (not significant). Based on the nature of variation 1&2 there would be no potential for any new construction phase effects, as there will be no change in the construction methods or location of the construction activities as a result of the change. Similarly, there would be no predicted change to the permanent loss of habitat or effects on species due to land take, as the land take will not change. As such the conclusion of no significant effects on habitats remains valid. The only potential for new effects is where the impact has a relationship to size of the turbine rotor diameter or maximum tip height with the turbines in operation. As a result, the only non-avian ecology receptor which could be affected by the turbine size change would be bats. The CWF ES 2015 bat survey indicated that no roosts were identified on or near the site (see Section	<u>Variation 1 & 2</u> No likely significant effects Subject to mitigation measures and advice from consultees.

[1] Based on an increase to existing residual effects or any new significant effect.

	also fed by a network of small burns. Watercourses on and near the site are of some nature conservation interest. *Fauna* A significant level of water vole activity was recorded in the protected species mammal surveys completed in September 2013 and 2015 (to support the CWF ES 2015) including used borrows, latrines and feeding stations. The activity was concentrated in three areas: a relatively large population in the north, White Loan Burn (13 animals) and two smaller ones in the east, Laggish Burn (five animals) and south, Dramahastie Burn (four animals) (see Appendix 9.2, Figure 2.1 of CWF ES 2015).No suitable habitat for great crested newt was recorded and very little evidence of otter *Lutra lutra* was found near Chirmorie Loch (off site) and along the burns in the 2014 and 2015 surveys (CWF ES 2015, Appendix 9.2). No signs of badger *Meles meles* or reptiles were recorded within the site boundary. Some habitat along the railway cutting could potentially be used by reptiles and further surveys would be undertaken prior to any construction works. Some of the burns on site have areas of habitat which are considered to be suitable to support brown trout *Salmo trutta* and European eel *Anguilla anguilla* which are species of conservation concern in the UK BAP and can have a significant commercial importance. An assessment of bat collision risk at the proposed Chirmorie Wind Farm was undertaken by Direct Ecology in 2013 (CWF ES 2015, Appendix 9.8). Overall, low levels of bat activity were recorded on the site, consistent with what was expected due to the open and exposed nature of the site. Most activity was recorded along habitat features such as Chirmorie Loch, the Water of Luce, plantation edges and	9.6.5) and flight lines through the site were unlikely to be at any significant risk from the development (see Appendix 9.8) and thus risk to bats is considered low and any effects not predicted to be significant. An updated Collision Risk Assessment (CRA) was completed by Ramboll (**Annex C**) to account for the increased tip height and blade diameter , along with the application of updated onshore windfarm assessment guidance for bats from Scottish Natural Heritage (SNH)[4] and Eurobats[5] . The original assessment complies with the since updated SNH and Eurobats guidance for the assessment of bat collision risk by onshore windfarm developments, as of 2020. The survey effort conducted at this site, between May and September 2013, fulfils best practice requirements, as does the quantification and assessment of bat activity across the site. The only alteration to be highlighted is that, as per updated collision risk methods cited in the updated SNH guidance, pipistrelle species are now classes as high risk for potential turbine collision at this site. Nycatlus species (Leisler's and Noctule), previously determined to be high risk, are now considered low risk at this site. The change in turbine specification does not alter the outcomes of this collision risk assessment for bats. The site layout, i.e. positioning of the turbines across the site, also remains unchanged. Recommendations made by the original assessment are still valid and should be considered in conjunction with recommendations set out in the updated CRA (**Annex C**). The need for post-	

[4] https://www.nature.scot/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation

[5] https://www.eurobats.org/sites/default/files/documents/publications/publication_series/pubseries_no6_english.pdf

	the woodland around Chirmorie farmhouse. The overall assessment of collision risk per species for this site utilised predicted species collision risk categories determined by Natural England (2014)[2]. Nyctalus species (Noctule and Leisler's bats) were the only species identified as having a high collision risk, however only low number were recorded on site. Variation 3 & 4 *Flora* The Ecological and Ornithological Technical Report undertaken by MacArthur Green 2019[3] (**Annex C**) found that wet modified bog forms the most extensive habitat across the study area. This wet modified bog encompasses the M2 *Sphagnum cuspidatum/fallax* bog pool NVC community, together with the M15 *Trichophorum germanicum – Erica tetralix* wet heath (when on peat over 0.5m in depth), M20 *Eriophorum vaginatum* blanket mire and M25 *Molinia caerulea – Potentilla erecta* mire NVC communities. The distribution of these habitats is shown in Figure 3a of the MacArthur Green Report (2019). There is also extensive peatland and potential GWDTE's within the study area (Figure 2 & 4). Similar findings were also reported within the Stranoch 2 EIAR. *Fauna* In combination the surveys undertaken as part of the MacArthur Green report 2019 (Figure 5b) and the STR2 ES 2018 (Figure 8.5a) encompass the whole 'spine track' and the 'link track' of the Proposed (varied) Development.	construction monitoring at developments where mitigation involves turbine curtailment has been included in the updated 2019 SNH guidelines therefore will be required as part of this development. Variation 3 & 4: ***Flora*** The STR2 ES considered habitat loss due to borrow pits separately to permanent infrastructure as it is unlikely that all of them would be required and although the existing habitat would be lost, these areas would be restored. Direct habitat loss from borrow pits was predicted to be around 2.86ha. The STR2 ES 2018 determined that with mitigation in place, there will be no significant effect on habitat loss due to the STR2 spine track and borrow pits. The track and borrow pits for this variation application are exactly as per the STR2 EIAR 2018, with the exception of the link track, so there is no potential for new significant effects from habitat loss, degradation, fragmentation except for the link track. An ecological assessment of the predicted effects of the link track was undertaken by MacArthur Green in 2019 (see **Annex C**). This concluded that with the exception of wet modified bog, all habitats and habitat features within the site would either not be directly affected by the proposed connecting access track (spine track and link track),or the habitats were assigned a value of less than local conservation importance[6], resulting in no significant impact.((	Variation 3 & 4 No likely significant effects subject to mitigation measures and advice from consultees.

[2] http://publications.naturalengland.org.uk/publication/35010

[3] CHIRMORIE WIND FARM ACCESS TRACK, Ecological and Ornithological Technical Report. MacArthur Green, 2019.

[6] Under the EIA guidelines, CIEEM 2018- Due to the absence of any protection status, their negligible ecological value to wildlife, and/or their species-poor flora and fauna and common species assemblage.

	Evidence of water vole *Arvicola amphibius* and common *Zootoca vivipara* lizard were recorded during these surveys. Incidental records were also made of adder *Vipera berus*. Surveys indicate that the study area may be used, at least periodically, by otter, badger and water vole. Bat surveys indicated that six species of bat use the study area. No other protected species were recorded. The majority of hydrological features in the study area are drains and first order burns, many of which are either modified to promote drainage, heavily poached, or occluded with Sphagnum mosses. The most notable area of fish habitat is the Cross Water of Luce and two of its tributaries. The Cross Water of Luce is known to contain salmon *Salmo salar*, trout and eel within the vicinity of the study area (as per results of surveys conducted for Stranoch Wind Farm ES in 2012).	Provided that good practice mitigation measures and the recommendations highlighted below are followed during the construction of the proposed connecting access track, it is considered that the construction effects on wet modified bog, predominantly habitat loss, would result in an effect of Long-Term temporal and Low spatial effect (within the context of the CIEEM 2018 guidelines). Consequently, any construction effects to wet modified bog habitats within the study area would therefore be considered to be a Minor adverse and Not Significant effect. These conclusions are similar to those identified within the STR2 ES 2018. Due to the extent of peatland and potential GWDTEs within the study area, it will not be possible to avoid all areas during the construction of the link track and there will be some localised construction impacts on these habitats. As stated above, these impacts are not considered to be significant with implementation of the recommended mitigation measures. A Habitat Management Plan (HMP) is proposed (STR2 EIAR, Appendix 8.J) to mitigate the effects on wet modified bog and blanket bog habitats within Stranoch estate to improve its condition over the life of the project. Figure 8.10 of the STR2 EIAR shows the area covered by the HMP. The 'link' track between STR and Chirmorie has been designed to avoid the proposed area of peatland restoration within the STR2 proposed HMP in this area. All mitigation measures are presented within **Annex B, Table 3.1.** ***Fauna***	

		The potential for displacement/disruption of breeding and foraging protected species and birds as a result of noise and general disturbance (for the duration of a particular construction activity within working hours, the duration of the whole construction period, or during the use of the proposed access track for turbine deliveries) as a result of increased construction traffic has been considered. With the specified mitigation (Annex B, Table B1) in place no significant effects on protected species is predicted. Effects on badgers, otters, water voles and reptiles were scoped out of the assessment, as the design had been modified to avoid areas where the above species had been recorded and relevant Species Protection Plans (SPP) will be in place . Mitigation commitments are stated below. The majority of the fish habitat within the study area is considered sub-optimal with respect to the availability of pristine spawning and juvenile habitat, however in the absence of mitigation there may be downstream effects including but not limited to: silting of spawning gravels, fish gill irritation, water quality degradation, and fish/macroinvertebrate mortality. Mitigation measures include commitments to prevent the mobilisation of silt and pollution into any surface water channel. The proposed water crossing over the Cross Water of Luce has the potential to fragment the fish habitat within the study area, however, would be avoided through appropriate design of the structure. The design would include the avoidance of instream works where at all possible and follows SEPA (2010): 'Engineering in the water environment: good practice guide'. A hydrological assessment[7] has been undertaken by Enviro Centre (see **Annex**	

[7] Stranoch Chirmorie access track watercourse crossing design: hydrological support. February 2019.

		C). This proposes the link track would use an open bottom culvert (classified as a minor bridge) to cross the watercourse in order to retain the bed, banks, soils and vegetation closest to the watercourse as undisturbed as practicably possible, following SEPA best practice. Providing all outlined mitigation measures are adopted no likely significant effects on fish are predicted. All proposed works would avoid in the area currently used by water vole. A 30m buffer would be applied around confirmed water vole habitat (where any species presence in this area was confirmed during pre-construction surveys), which would also exclude plant, vehicle or site compound storage in this area. If any areas of water vole habitat cannot be avoided, translocation of water voles into another suitable area of habitat may be required under a licence from SNH. With mitigation measures implemented in accordance with a Species Protection Plan (SPP), the effect is considered to be negligible and not significant within the context of the CIEEM guidelines. Checks for reptiles, using visual searches, would be completed by the ECoW or suitably qualified ecologist in the active period (March to September) immediately prior to ground works being undertaken. Providing mitigation measures are adopted, and all potential reptile hibernacula would be avoided, and no likely significant effects would arise. Pre-construction protected species surveys will be carried out to inform a Species Protection Plan (SPP) which will be produced prior to the commencement of ground works, including the deployment of plant, machinery or site compounds. An Ecological Clerk of Works (ECoW) would be appointed to oversee works.	

RepeBiodiversity (ornithology)	Statutory Designated sites The closest statutory designation to the Proposed (varied) Development boundary is the Glen App and Galloway Moors Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI). The designated site encompasses the land to the west of the Proposed (varied) Development, running parallel with the link and spine track until the U90W which bisects the SPA. The site supports a breeding population of European importance Annex 1[8] species of hen harrier *Circus cyaneus*. All other statutory designated sites are located >3km from the site boundary and/or do not have any hydrological connectivity. All ecological designated sites within 10km of the Proposed (varied) Development are illustrated in **Annex A, Figure 5.1.** Variation 1 & 2 The CWF ES 2015 describes the habitats on and near the site as supporting farmland and moorland birds typical of the area. Buzzard (green listed) and kestrel (amber listed) were the only raptors recorded breeding onsite. Breeding waders included modest numbers of curlew (amber listed) and snipe (amber listed) on or near the site. Collision risk	Variation 1 &2 A Habitats Regulations Appraisal (HRA) was undertaken for the CWF ES (2015) and identified that there would be no effects from wind farm operation on the integrity and conservation objectives of the Glen App and Galloway Moors SPA. The qualifying feature of the SPA, hen harrier, would not be compromised as a result of wind farm operation. An updated bird collision risk assessment (CRA) was undertaken in early 2020 (**Annex C**) in relation to the increased turbine dimensions - The revised calculations demonstrate that the modelled changes in the turbine characteristics and number of turbines will not change the previous interpretations of the levels of impacts of the Chirmorie wind farm on birds. A change in the estimated 25-year hen harrier collision mortality from 0.23 to 0.24 is not sufficiently material to require a revised HRA (with respect to turbine modifications). Variation 3 & 4 The southernmost section of the proposed access track will utilise a section of existing road (the U90w) that bisects the Glen App	Variation 1 &2 No likely signficant effects subject to mitigation measures and HRA assessment. Variation 3 & 4

[8] ANNEX 1 species are those identified in Annex 1 of the European Union Directive on the Conservation of Wild Birds 79/409/EEC. Under this Directive the UK is committed to take 'the requisite measures to preserve, maintain or re-establish a sufficient diversity and area of habitat for all species of naturally occurring birds in the wild state'. The UK is also bound to take special measures to conserve the habitats of certain rare or vulnerable species as well as regularly occurring migratory species. Conservation measures include the designation of suitable areas as Special Protection Areas (SPAs) and the protection of SPAs from damaging developments

	assessments (CRA) were undertaken in 2015 for curlew, golden plover and hen harrier (schedule 1 and red listed). <u>Variation 3 & 4</u> Evidence of breeding barn owl was observed approximately 1km from the access track. No evidence of breeding hen harrier or short-eared owl has been identified; however, all three species were recorded during flight activity surveys in the wider area. Single goshawk was recorded but no evidence of breeding. Breeding curlew (2-6 pairs) and snipe (4-8 pairs) were both recorded within the access track site boundary. Oystercatchers were also recorded in the area. Two flocks (80 and 90 birds) of non-breeding golden plover were recorded (no evidence of breeding).	and Galloway Moors Special Protection Area (SPA) (designated for breeding hen harrier). This is the same access route as proposed for the consented Stranoch Wind Farm and in planning Stranoch 2 Wind Farm. Combining the access arrangements for CWF and STR2 may result in a temporary increase in construction traffic flow and it is predicted to extend the duration for which construction traffic will use the access route compared with that predicted for STR wind farm on its own. However, a TMP will be in place. Under the Habitats Regulations, a likely significant effect as a result of the use of the U90W as an access route for CWF cannot be ruled out, therefore a Habitat Regulation Assessment (HRA) (to inform an Appropriate Assessment) has been undertaken (MacArthur Green, 2020) to establish whether the traffic numbers relating to the construction of Chirmorie wind farm will give rise to an adverse effect on the integrity (AEOI) of the (Glen App and Galloway Moors) SPA. When considering this mitigation, it can be reasonably concluded that no adverse effects on the integrity of the Glen App and Galloway Moors SPA would result from the use of the U90w in the CWF project alone, or as a result of in-combination effects due to the U90w also being used as the access route for the Stranoch/Stranoch 2 proposal (**Annex C**). The STR1 and STR 2 HRAs concluded that there was no AEOI on the SPA when including the traffic mitigation. therefore, as long as there is no significant overlap in the use of the U90W between CWF and STR1&2 or if the CWF traffic levels are similar to STR 2, the updated HRA (for CWF access) is likely to conclude the same. No other significant effects on ornithology are predicted with mitigation measures in place. Key measures are summarised	No likely significant effects subject to mitigation measures including a Breeding Bird Protection Plan.

		below, and all mitigation measures are collated in **Annex B, Table B1.** • Pre-construction surveys to check for breeding waders and Annex 1/Schedule 1 raptors and owls along the proposed route (to be undertaken by a suitably licensed ornithologist); • Monitoring of any wader, raptor and/or owl nests (to be undertaken by the ECoW with the assistance of a suitably licensed ornithologist). • Avoidance of destruction or disturbance to any active nests by application of suitable species-specific buffer distances. Any Schedule 1 raptor nests should be buffered by a minimum of 500m. • A Breeding Bird Protection Plan (BBPP), which can be secured by condition to the grant of any planning consent, will be produced for the Proposed (varied) Development to ensure that all reasonable precautions are taken to ensure the relevant wildlife legislation is adhered to.	
Landscape and Visual Amenity	<u>Variation 1 & 2</u> The location of the turbines will be the same as the previously consented scheme. The proposed turbines would be increased in height by 3 m to blade tip (BT), taking tip height from 146.5 to 149.9m. Correspondingly the rotor diameter will increase from approximately 114 m to approximately 136 m. As a result, the proposed hub height will decrease from approximately 89.5 to 81.5 (8 m). There will be no change to the size of the study area which will remain at 40 km (Figure 8.1, CWF ES 2015), in line with Scottish Natural Heritage guidance, 2017[3]. Subsequently the landscape and visual receptors identified within the	<u>Variation 1 & 2</u> It is considered that there would be no significant additional effects to the landscape fabric, landscape character, views and visual amenity from the proposals. There will also be no effects on designated landscapes as a result of the height increase. Comparative wirelines and a comparative zone of theoretical visibility (ZTV) were produced for this assessment, to identify any significant changes as a result of the height variation (See **Annex A, Figure 2.1**). Viewpoints 1, 2, 5, 6 and 17 from CWF ES (2015) were used to assess any changes to visual amenity as a result of height	<u>Variation 1 & 2</u> No likely significant effects. The potential additional landscape and visual impact effects are considered to be marginal and not of a magnitude that requires assessment through EIA. The additional effects can be adequately assessed through the submission of a Landscape and Visual Impact Assessment.

[3] Retrieved from https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf

	baseline study area have not changed from the original submission. The most notable change in the cumulative situation is that Altercannoch, a windfarm considered in the LVIA at the scoping stage was then refused planning permission in 2017. Cumulative landscape and visual effects are addressed later in this table (see below). <u>Variation 3 & 4</u> The proposed route of the access track is situated in gently raising plateau of upland unimproved grassland flanked by established commercial coniferous forestry to the North West (see **Annex A, Figure 3.1**). The proposed access route crosses Dumfries & Galloway into South Ayrshire. The route transitions between the Plateau Moorland Landscape Character Type (LCT)(LCT17) and the Plateau Moorland with Forestry and Wind Farm LCT (LCT18C) as defined by the Dumfries & Galloway Capacity Study [1](2018) and the South Ayrshire Landscape Capacity Study[2](2018). The landforms of both these LCTs follow a pattern of broad rounded hills and basins, which appear comparatively indistinct in comparison to the settled glens and valleys surrounding the moorland edge. Within the Plateau Moorland with Forestry and Wind Farm LCT there are several operational windfarms across the two largest areas of this LCT. The proposed route links into the access route the proposed Strannoch 2 wind farm track,	increase. Across the selected viewpoints there will be no change to the number of hubs or blade tips visible. Minor changes to the geometry are visible from the viewpoints (**Annex A, Figure 7.2 A-J**). These amended geometries resulting from an increase in height are not predicted to materially affect the assessment . A ZTV (**Annex A, Figure 7.1**) was produced to outline the additional visibility resulting from the proposed turbie height increase. The tip increase extends the visibility in isolated locations by up to 150 m. Some margins of scattered additional visibility will occur to fringes of local areas, including within the Kilquhockadale Forest, parts of Eldrig Moss and a small area north of Sand End. The pattern of visibility closely matches the consented scheme across the study area. This confirms that there would be no material change to the findings of the original LVIA assessment. It is predicted that there will be no significant change the landscape and visual impact assessment as result of the proposed variation in turbine geometry. Variation 2 introduces a construction phase access route from the east from the existing unclassified public road between New Luce and Barrhill to facilitate the construction of the consented bridge over the railway which bisects the site. This access would be as per the original CWF consent, but would be used during the construction phase only to facilitate the construction of the consented bridge over the railway which bisects the site. The access point and track would be retained for the operational phase for use by non-HGV traffic only. No significant landscape or visual effects were predicted in the CWF ES 2015 as a result of access track construction and this finding remains valid for the proposed variation.	

[1] Retrieved from https://www.dumgal.gov.uk/media/18596/Dumfries-and-Galloway-Wind-Farm-Land-Capacity-Study-Appendix-C/pdf/Wind_Energy_Appendix_C_Landscape_June_2017.pdf

[2] Retrieved from https://www.south-ayrshire.gov.uk/planning/documents/south%20ayrshire%20landscape%20wind%20capacity%20study%20-%20final%20august%202018.pdf

	before joining route of Strannoch 1 wind farm track. The route to Strannoch 1 wind farm joins a minor road close to Penwhirn reservoir then links the A77 north of Cairnryan. This landscape is very sparsely settled with few roads. The C72 local road passes to the east of the Proposed (varied) Development. This quiet rural road provides a link between Barrhill and New Luce. The nearest property to the section of new proposed track is located approximately 1.6 km to the south west at Markdhu. No core paths or long-distance footpaths are located within 2 km of the proposed access.	<u>Variation 3 & 4</u> It is not predicted that there would be significant effects to the landscape fabric, landscape character, views and visual amenity from these aspects of the proposed variation. There will be no effects on designated landscapes as a result of the new section of track (link track). The new link track would disturb a section of moorland used for rough grazing. However this is deemed to be a minor change within the context of the surrounding landscape, therefore no significant effects on the overall landscape fabric are expected as result of the Proposed (varied) Development. The proposed access track is characteristic of the landscape pattern within the Plateau Moorland with Forestry and Wind Farm LCT and Plateau Moorland with Forestry LCT, since the LCT is crossed by forestry tracks and tracks associated with windfarm development. No significant effects are predicted on Landscape Character as a result of the Proposed (varied) Development provided that all mitigation for sensitive design and restoration of the new link track was implemented. No properties would have views to the proposed access track. There is also no view for users of the minor road passing Chirmorrie Farm to the proposed access track, due to localised topography. The rail route between Barrhill to Stranraer would pass within 250 m to 500 m of the new section of track. Views to the new section of track are expected for a duration of approximately 900 m of the route. It is predicted that there would be no significant visual effect for train passengers due to the short duration and transient nature of the rail route's visibility.	<u>Variation 3 & 4</u> No likely significant effects. The effects require to be fully assessed in the application to determine the mitigation measures required.
Cultural Heritage	<u>Variation 1 & 2</u> The CWF ES 2015 identified a number of cultural heritage assets within the development site which include later	<u>Variation 1 & 2</u> No change is proposed to the wind farm infrastructure; therefore, no new or additional direct effects are predicted. The CWF ES 2015 concluded no significant adverse effects were predicted on	<u>Variation 1 & 2</u> No likely significant effects.

	prehistoric field systems; medieval and post-medieval farmsteads and buildings; shielings/ huts; sheepfolds; sheep shelters/ pens/ enclosures; quarries/ gravel pits and a number of miscellaneous assets. Scheduled monuments are located in the surrounding landscape including Cairn Kenny and Markdhu Cairn which lie just under 1km to the south-west of the development. <u>Variation 3 & 4</u> An assessment by Headland Archaeology (Annex C) for the proposed link road concluded 1.3km of the road will cross the East Rhins Archaeologically Sensitive Area (ASA) and is in the vicinity of several Scheduled Monuments. Three Scheduled Monuments are within 250m of the study area: • Cairn Kenny, chambered cairn (Reference SM1925). • Markdhu, cairn 1450 m NNW of (Reference SM4861). • Maurs Cairn, enclosure 1100 NNW of (Reference SM4869). There are three non-designated heritage assets within 250m of the link road including: • High Murdonochee, Shieling Hut (post Medieval) (ID 61795). • Eldrig Rig, Structure (period Unassigned) (ID 170319). • High Murdonochee, Enclosure (period Unassigned), Sheepfold (period Unassigned) (ID 170320). There may also be previously unrecorded archaeological deposits surviving as buried remains within the river corridor.	the cultural heritage assets within the development site. Moderate adverse indirect effects are predicted on the setting of two scheduled monuments: Cairn Kenny and Markdhu which are located 2km south of the consented CWF. No increase in the significance of the impact on the scheduled monuments is expected as a result of the proposed changes to the turbines. This is because the increase in tip height is small and anticipated to be relatively imperceptible. The rotor diameter change would be noticeable from within closer proximity but this change in geometry is not considered to materially change the effect on the assessment of setting. All mitigation measures and planning conditions stated in the CWF ES 2015 will be adhered to. <u>Variation 3 & 4</u> The STR2 EIAR 2018 stated five scheduled monuments are within 50 m of the proposed spine track which would be predicted to have direct minor significant construction effects on the Castle Kennedy Inventory Garden Designed Landscape IGDL. For the additional historical sites identified, with the proposed mitigation measures (**Annex B, Table B1**) in place no significant effects on setting are predicted as a result of the proposed new link track or borrow pits provided that all mitigation for sensitive design and restoration of the new link track was implemented. The Headland Archaeology assessment (**Annex C**) identified three Scheduled Monuments and three non-designated heritage assets were identified within the 250m Study Area. Approximately 1.3km of the proposed 1.7km long link road is within the East Rhins Archaeologically Sensitive Area, and there may be a risk of previously unrecorded archaeological deposits surviving as buried remains within the road. However, there are no direct effects on heritage assets and mitigation measures will be applied as per STR2 EIAR 2018. Therefore, no increase in existing effects or any	As the wind turbine locations are not altered, no new or additional direct effects are predicted. The orignial EIA predicted moderate adverse indirect effects on the setting of the two scheduled monuments (Cairn Kennedy and Markdhu), which are located 2km south of the site. The magnitude of impact will not increase as the increase in blade tip height is anticipated to be imperceptible when viewed from the monuments. The potential cultural herigage effects are considered to be marginal and not of a magnitude that requires assessment through EIA. The application can provide the an assessment of effects on cultural heritage to determine if mitigation measures are required. <u>Variation 3 & 4</u> No likely significant effects. No adverse impact on known heritage assets are predicted and mitigation will be in place should previously unrecorded achaeology be discovered during excavation of the additional track.

	STR2 EIAR 2018 concluded within the Inner Study Area[9] (Figure 7.23) there are 12 scheduled monuments, 24 previously undesignated cultural heritage assets and 16 cultural heritage assets.	no significant effects on cultural heritage are expected as a result of the Proposed (varied) Development.	
Geology and Soils	<u>Variation 1 & 2</u> The CWF ES 2015 and according to the BGS 1:625,000 scale map indicates the site is underlain by wackes of the Galdenoch and Kirkcolm Formation with superficial glacial and peat deposits. Peat depths range from very shallow to 3 m. The volume of peat to be excavated is estimated at approximately 53,000 m^3. <u>Variation 3 & 4</u> As noted in the STR2 EIAR 2018 the spine track is, according to the BGS 1:625,000 scale map underlain by the Kirkcolm Formation (Wacke) with superficial peat deposits. Soils Mapping from the JHI indicate blanket peat is present across the majority of the development site. Peat survey work carried out by EnviroCentre[10] for the section of new access track to be formed at the southern extent of the wind farm has identified that from the Cross Water of Luce watercourse crossing, 200 m of proposed track would route through a large area of deep peat, with maximum recorded depths of 4.1 m. Approximately 100 m either side of the watercourse crossing, to the east of Cairn Kenny midway up the proposed access track, recorded peat depths were in excess of 2 m, with greatest depths recorded near the proposed crossing location (3.6 m). Details of peat depths along the spine and link track are illustrated in **Annex D.**	<u>Variation 1 & 2</u> No change is proposed to the wind farm infrastructure; therefore, no new or additional direct effects are predicted. The conclusions of the CWF ES 2015 remain valid and mitigation measures and consent conditions will be adhered to. The conclusions are as follows: the site is not within an area which is designated for its geological interests and no locally important geological features or exposures would be directly affected by the construction activities. The windfarm infrastructure has been designed to avoid areas of deep peat and steeper gradients. Through appropriate mitigation the risk of peat slide is not predicted to be significant. Good practice measures would be implemented during construction to ensure the impacts on peat would be minimised and re-use made of disturbed peat in restoration of the site. There would be disturbance to areas of solid geology through the excavation of borrow pits onsite. Post- construction the borrow pits would be restored. No increase in the significance of the above impacts are anticipated as a result of the proposed changes to the turbines or the construction access track (variation 2).	<u>Variation 1 & 2</u> No likely signficant effects. Subject to mitigation measures and implementation of SEPA recommendations and regulatory requirements.

[9] Covers the same area as used for the Stranoch 1 Inner Study Area, and in respect of both Stranoch 1 and Stranoch 2

[10] Summary email of results – EnviroCentre 20.11.18

		Variation 3 & 4 A Peat Landslide Risk Assessment and Peat Management Plan was written for the STR2 EIAR 2018 spine road and includes good practice guidance for the site. The STR 2 EIAR concluded with appropriate mitigation measures and management plans in place, no significant effects are anticipated from construction and operation of the spine track. A Peat Management Plan has been prepared. The proposed link track extension is not within an area which is designated for its geological interests and no locally important geological features or exposures would be directly affected by the construction activities. The link track would disturb areas of soil, as well as peat > 0.5 m depth, particularly in the vicinity of the Cross Water of Luce watercourse as noted in the EnviroCentre peat survey (**Annex C**) but is not considered significant with implementation of specified mitigation measures. Pollution risk as a result of excavations for the track is high as a result of the proximity of the watercourse to deep peat. The Peat Management Plan prepared for CWF includes good practice measures for the management, handling and storage of peat on site and mitigation measures to prevent accidental release of silt to watercourses during construction would be implemented. A Habitat Management Plan (HMP) would be produced for implementation of post construction site restoration and would include the location and approach to implementing ecological enhancements and mitigation where applicable.	Variation 3 & 4 No likely significant effects. A Peat Landslide Hazard Risk Assessment requires to be provided to fully assess the effects of the proposed new access tracks. Subject to mitigation measures and regulatory requiriments for the management of peat.
Water Resources and Flood Risk	Variation 1 & 2 The CWF ES 2015 notes there are no large watercourses on the site, the closest significant watercourse is the upper part of the Cross Water of Luce which follows the western and southern boundary. A number of small burns originate in the site which generally drain north to the south from the central part of the site in turn feeding more substantial	Variation 1 & 2 No change is proposed to the wind farm infrastructure; therefore, no new or additional direct effects are predicted. As a result, the CWF ES (2015) conclusion, that there would be no significant impacts to hydrology, water quality, drainage, surface water and groundwater remain valid provided all mitigation measures were implemented including good practice design for site drainage. The	Variation 1 & 2 No likely significant effects subject to mitigation measures. The effects of the proposed new access tracks and other infrastruture require to be assessed in terms of hydrology, water

	burns away from the site. The 0.5% Annual Probability (AP) (200 year) flood outline does not come close to any of the proposed wind farm infrastructure, which lies more than 400 m (and uphill) from the watercourse. The site is considered vulnerable to groundwater pollutants. It is not located in a designated drinking water protected area. A number of Private Water Supplies (PWS) are located within 5km of the site but none is closer than 0.5km. <u>Variation 3 & 4</u> Enviro Centre undertook a hydrological assessment(**Annex C**) for the link track which would cross the Cross Water of Luce between the Stranoch and Chirmorie wind farms. This watercourse originates in the Arecleoch Forest and is a tributary of the Water of Luce which flows south towards and into Luce Bay. The preferred crossing point is located approximately 2 km west of the minor public road. Topographic survey of the preferred crossing point show: • The main channel is approximately 1.93 m deep and 8.1 m wide with a very low gradient. • The channel expands onto a wide floodplain with a gradient of approximately 0.001 m/m. The catchment area of the watercourse is approximately 10.85 km^2. STR2 EIAR 2018 found no PWS sourced from surface water in proximity to the development site and this was scoped out of the assessment. One PWS is sourced from surface water along the U90w at High Craigcaffie but the intake is upslope of the proposed spine work upgrades and would therefore be unaffected by the Proposed (varied) Development.	contractor and ECoW would monitor the effectiveness of all mitigation and operational measures during all phases of construction and implement further protection measures if required. No increase in the significance of the above residual impacts is anticipated as a result of the proposed changes to the turbines as the footprint of the development has not altered and all mitigation measures will be adhered to. <u>Variation 3 & 4</u> It is acknowledged that there is potential pollution risk as a result of construction works, however these will be managed with the mitigation measures outlined in **Annex B, Table B1**, therefore no significant effects are predicted. The residual effects arising during the construction and operational phase are considered to be minor to negligible if the appropriate mitigation is used as outlined in the STR2 EIAR, Chapter 10. There is the potential for residual impacts as a result of hydrological alterations, sediment and contaminant discharges, soil loss and erosion, and peat instability, although these are all considered to be of low to negligible significance It is acknowledged that for the crossing of the Main Water of Luce (at the Stranoch wind farm access) a bridging structure will be necessary due to the span required between riverbanks. The form of structure has been designed to ensure that works to the riverbanks will be kept to a minimum and to avoid direct impacts to the bed of the watercourse. The Enviro Centre hydrological assessment (**Annex C**) proposed the crossing of the Cross Water of Luce for the link track would use an open bottom culvert (classified as a minor bridge) to cross the watercourse in order to retain the bed, banks, soils and vegetation closest to the watercourse as undisturbed as practicably possible, in line with SEPA best practice. The crossing of this design would have a minimum approximate cross-sectional	waulity, drainage, surface water and groudnwater. <u>Variation 3 & 4</u> No likely significant effects. Subject to mitigation measures and in line with SEPA best practice and regulatory requirements.

		area of 30.1 m^2. The crossing structure would be designed with adequate hydraulic capacity to convey the 0.5% (200 year) AP flood event without increasing flood risk to the surrounding area as required by SEPA. All mitigation measures are stated within **Annex B, Table B1,** however some key measures are stated below. • An EMP, including surface water management and pollution prevention measures (e.g. Pollution Prevention Plan), would be produced. The EMP will remain a live document and will be continually updated as the work progresses. Mitigation measures will be incorporated into the EMP, which would include those set out in a Construction Method Statement (CMS). The EMP would be submitted prior to commencement of the Proposed (varied) Development for approval by Dumfries and Galloway Council, in consultation with SEPA and other agencies such as SNH. • An Environmental Clerk of Works (ECoW) would supervise the construction works to ensure that the EMP and associated mitigation measures are being implemented effectively.	
Noise	<u>Variation 1 & 2</u> The following noise receptors were assessed as part of the CWF ES 2015, Figure 12.1.	<u>Variation 1 & 2</u> For the construction phase, predicted noise levels calculated in accordance with BS 5228-1:2009:+A1:2014 have been compared against an appropriate absolute assessment criterion. The CWF ES	<u>Variation 1 & 2</u> No likely significant effects. The potential noise effects of the propopsed varied Development are

		2015 determined that with appropriate mitigation in place, the residual effects significance is expected to be Negligible to Minor (not significant) for the vast majority of the time. A Moderate effect (significant) was identified when works associated with local road improvements are undertaken at the closest associated distances to existing receptors. However, this would be of limited duration and all impacts during the construction period would be local and temporary. It has been established that local receptors are sufficiently removed from proposed construction works such that an effect of only Negligible (not significant) would result. Detailed noise level predictions (operational) were undertaken in accordance with the IoA GPG, for the CWF site operating in isolation, and the results were compared against the derived noise level limits. It was concluded that the night-time limit can be complied even when all turbines are operating in full power mode. For the daytime, the noise level limit can be complied with use of a number of different noise management schemes. It has also been identified when accounting for wind direction, the extent of the daytime noise management schemes can be further reduced. In consideration of the assessment outcome, the significance of the residual effects of the Proposed (varied) Development has been identified as only Negligible to Minor (not significant). Construction noise from the Proposed (varied) Development is likely to be very similar to the original CWF site, therefore would be subject to the same controls. Operational noise levels will also adhere to these same controls. All committed mitigation measures will be adhered to and additional measures will be provisioned if required, to ensure that all (daytime & night-time) noise conditions are met considering the turbine modifications. <u>Variation 3 & 4</u>	considered to be marginal and not of a magnitude that requires assessment through EIA. This issue can be adequately assessed through the submisssion of an updated noise impact assessment. <u>Variation 3 & 4</u>

Receptor Name	X	Y	Distance to Closest Turbine (m)
Markdhu	**218469**	**573584**	**2319**
Miltonise	**218966**	**573415**	**2409**
Laggish	**223168**	**578199**	**2905**
Dochroyle	**223094**	**579107**	**3269**
Marklach	**217564**	**572364**	**3773**

The prevailing background noise levels at local noise-sensitive receptors is anticipated to be dominated by natural sources such as noise from the wind and the effects of the wind on vegetation etc. A baseline noise survey was not completed because the assessment methodologies adopted were applicable to low noise areas. The assessment method adopted stringent noise level criteria, compliance with which would ensure that any resulting noise levels at sensitive receptors would not be significant.

- The noise limit for the Proposed (varied) Development was set 10dB lower, at 30dB(A) daytime and 33dB(A) night time, than the ETSU-R-97 limits or 10dB below the conditioned limits such that a significant cumulative impact could be avoided.

<u>Variation 3 & 4</u>

The receptors considered as part of the STR 2 ES 2018 operational noise assessment are those defined within the planning conditions for the consented Stranoch 1 Wind Farm. It is understood that there are no new dwellings planned or built since the previous application that would require further consideration here.

No further background noise survey has been undertaken since no changes have occurred since that survey that

	would materially affect existing background noise levels. Therefore, it is considered that the existing information that informs the consented Stranoch 1 noise limits can still be relied upon as baseline information for the purposes of this revised application, as agreed within the scoping opinion for the revised scheme. It should also be noted that the baseline noise levels exclude any influence from existing turbine noise, as required by ETSU-R-97. The STR 2 ES 2018 determined that noise associated with the construction and decommissioning of the STR 2 wind farm Development did not warrant detailed assessment on the basis of the lack of receptors with the potential to experience adverse noise effects associated with construction. STR2 is expected to meet the requirements of noise guidance (i.e. BS 5228) and will follow the same approach provided in the Stranoch 1 ES.	No detailed assessment of the construction phase of work from STR1 or 2 was deemed required because there are no nearby receptors which might be subject to significant adverse noise effects. All construction activities would be undertaken in accordance with good practice as set out in BS 5228-1:2009+A1:2014. On this basis, there would be no likely significant effects from construction noise as a result of bringing variation 3 and 4 into the CWF consent. The link track will extend the length of time construction traffic will be using the access as CWF and STR2 are proposed to be constructed sequentially. The construction traffic will be managed via a Construction Traffic Management Plan (CTMP) and the CTMP would be agreed with Dumfries & Galloway Council (D&GC) and South Ayrshire Council (SAC) prior to construction works commencing. These measures will ensure that all noise conditions are met and there will be no significant effect on any sensitive receptors.	No likely significant effects subject to mitigatio measures where required.

Air Quality	Variation 1 & 2 The CWF ES 2015 notes the site is rural in character and air quality in the area is good and typical of rural areas. Modelled data for 2015 indicates annual average background concentrations of the key local air pollutants of nitrogen dioxide (NO_2) of 2.7 micrograms per cubic metre (µg m^{-3}) and of particulate matter (PM_{10}) of 9.1µg m^{-3} which are well below levels set in legislation for human health and the environment. There may be some minor local influences on air quality from road traffic emissions on roads in the area. There are no Air Quality Management Areas (AQMAs)[11] in South Ayrshire or in Dumfries and Galloway. There are few residential property receptors in proximity to the Proposed (varied) Development. The nearest property is the house at Chirmorie Farm located approximately 590 m from the nearest turbine. There are no designated ecological sites adjacent to, or in the vicinity of the Proposed (varied) Development which would be sensitive to changes in air pollutants from construction of the proposals. Habitats on site are mainly modified bog on peat and thus sensitive to dust. The principal aquatic receptor of any sensitivity to the site is the Cross Water of Luce which lies adjacent to the western and southern boundary of the Proposed (varied) Development. Variation 3 & 4 Air quality was scoped out of the STR 2 EIAR 2018 but was still considered in part within the 'Traffic and Transport'	Variation 1 & 2 The CWF ES 2015 concluded no significant effects on local air quality are predicted during construction, operation and decommissioning provided all mitigation measures are successfully implemented. Significant effects are avoided because the site would be restored following construction and access tracks maintained in good condition and so no dust risk would remain. The damp climatic conditions also reduce the production and effects of dust. The turbines and other key infrastructure have been sited to avoid or reduce peat loss where possible. There would be an indirect benefit on local and global air quality through the generation of electricity from renewable sources. Disturbance of peat would be minimised to that essential for the works and peat would be handled and stored in accordance with good site practices and a Peat Management Plan. No increase in the significance of air quality impacts (as stated in the CWF ES 2015) is anticipated as a result of the proposed changes to the turbines and all mitigation measures (**Annex B, Table B1)** will be adhered to. Additionally, the increased rotor diameter would increase the energy generation potential and efficiency of the site improving the total carbon dioxide savings. Variation 3 & 4 The STR 2 EIAR 2018 concluded the percentage of traffic on the access roads would increase as a result of the development but would be below the Annual Average Daily Traffic (AADT)	Variation 1 No likely significant effects. The potential air quality effects are considered to be marginal and not of a magnitude that requires assessment through EIA. Variation 2 No likely significant effects. The volume of vehicle movements is not significant in the context of EIA in terms of Air quality.

[11] An area designated because it has not met air quality standards and objectives set out in the Air Quality Standards (Scotland) Regulations 2010

	chapter. The A77, A75, U90w and U84w minor roads would be used to access the site. Existing traffic volumes were assessed using bespoke traffic surveys and information provided by Transport Scotland. There are no Air Quality Management Areas (AQMAs) in South Ayrshire or Dumfries and Galloway.	thresholds[12] (as well as other screening criteria[13]) and not therefore impact local air quality. The construction programmes (Table 3.2) of CWF and STR2 are sequential (small crossover between the end of CWF construction and the start of STR 2), Considering this, construction of the link track is unlikely to significantly increase the AADT flows during the construction period. Therefore, the traffic levels are predicted to remain below the air quality screening criteria and there will be no significant local air quality impact on any sensitive receptors within the vicinity. Mitigation measures proposed with regards to emissions and dust would be adhered to (**Annex B, Table B1).**	
Land Use and Forestry	<u>Variation 1 & 2</u> The CWF site as described in the CWF ES 2015 is an area of undulating upland and rough grazing and is bounded to the north by commercial forestry, to the west by the existing Arecleoch Wind Farm, to the east by the C72 Barrhill to New Luce public road and to the south and south west by the upper reaches of the Cross Water of Luce. Kilgallioch Wind Farm lies south east of the CWF site. There are approximately eight residential properties within 3km of the nearest turbine, with the closest commercial properties in Barrhill Village. No public roads run through the site, however there are a number of minor tracks which connect with the C72 between Barrhill and Chirmorie providing access to properties. There is a one rough farm track which provides	<u>Variation 1 & 2</u> The CWF ES 2015 concluded the CWF site would result in a permanent change in land use of approximately 12ha in the areas required for the turbine hardstandings, access tracks, on-site substation and control building and other associated infrastructure including the anemometer mast bases. No change is proposed to the wind farm infrastructure/ land use from the proposed variations and no significant new or additional direct effects are predicted. The change in land use is not considered to be significant because the land take is not predicted to affect the viability of the farm unit at Chirmorie, the land has limited capability for agriculture (other than rough grazing) and the proportion of land which would be affected by the proposals is small.	<u>Variation 1 & 2</u> No likely significant effects. The potential land use and forestry effects are considered to be marginal and not of a magnitude that requires assessment through EIA. The appropriate assessment of effects on forestry require to be assessed in the application.

[12] Rule 1" - include road links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and "Rule 2" - include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more". Guidelines for the Environmental Assessment of Road Traffic, 1993, Institution of Environmental Management and Assessment (IEMA);

[13] The DMRB HA 207/07 Air Quality Screening criteria are: Road alignment will change by 5 metres or more; or Daily traffic flows will change by 1,000 AADT or more; or Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or Daily average speed will change by 10 km/hr or more; or Peak hour speed will change by 20 km/hr or more.

	access from the C72 westwards across the northern part of the wind farm site area. There are no formal paths or recreational routes within the wind farm site boundary, however there are a number of core paths are present within 5km of the CWF site. The agricultural land capability of the area proposed for the wind farm site is predominantly within Class 6 which is categorised as being suitable only for rough grazing. There are extensive areas of coniferous forest plantation to the north and north east of the wind farm site which forms part a large area known as Arecleoch Forest and which is owned and managed by the Forestry Commission Scotland. There are two areas of woodland which are listed in the Ancient Woodland Inventory (AWI) within 5 km of the Proposed (varied) Development: - 4.7 km north-west of the site (NGR NX 158 826), and - 4.1 km north-east of the site (NGR NX 229 814). <u>Variation 3 & 4</u> The STR2 site is located within an area of moorland plateau. It can be divided into three sections; the northern site area and the southern site area are both similar in size and characterised by gently undulating moorland used for sheep grazing. They are separated by a small, shallow valley running northwest to southeast containing the Davenholm Burn and a track which joins the minor road to Lagafater Lodge at Drumley (the continuation of the U84w) to the minor road at Glenwhilly near Dirniemow Bridge; and the single-track road that connects New Luce and Barrhill (the C1w). The mainland uses within the Site are moorland grazing and some shooting	Access to all properties would be maintained following construction of the wind farm and public road improvements. No significant permanent effects on any routes used for walking, cycling or equestrians would be predicted, including core paths. The new access tracks could provide some increased opportunities for recreation by walkers and cyclists. No properties would be required to be demolished. There is likely to be some temporary disruption to public roads (during construction), however a Traffic Management Plan (TMP) would be put in place. No change to the effects on land use are predicted as a result of the turbine modifications or access track. Therefore, the conclusions of the CWF ES 2015 remain valid and any mitigation measures or conditions will be adhered to **(Annex B, Table B1).** <u>Variation 3 & 4</u> A relatively small area of upland grazing would be displaced in the footprint of the STR 1 Wind Farm, but this would not affect the viability of any farms and grazing would continue throughout construction and operation of the Stranoch 1 Wind Farm. The principal land use change is the creation of a wind farm where the diversification for farms and increased revenue compensates for the small reduction in grazing land. Further considerations relating to land use were therefore scoped out of the STR2 EIAR 2018 on the basis that the STR2 wind farm is development of the same nature as STR1. The proposed link track slightly extends the area of land impacted by new infrastructure; however, this is not predicted to be significant as the land use is similar, and the viability of any surrounding farms will not be impacted.	<u>Variation 3 & 4</u> No likely significant effects. It is not considered that the impact on Land Use and Forestry requires to be assessed through EIA. The appropriate assessment of effects on forestry require to be assessed in the application.

Major Accidents	<u>Variation 1 & 2</u> The requirement for consideration of major accidents and disaster was introduced in the 2017 EIA Regulations and as a result an assessment of major accidents and disasters was not included in the CWF ES (2015) as this EIA was undertaken under the 2014 EIA Regulations. <u>Variation 3 & 4</u> Major accidents and disasters were scoped into the STR 2 EIA where they represented a high risk to the development, either from the proposed location or from the project itself. A high risk was considered to be where there was reasonable likelihood of the accident or disaster occurring, or where the effect of the accident or disaster would lead to mitigation which is beyond the usual scope of construction or operational activities. The following major accidents and disasters were scoped in: landslides; severe weather (storms and extreme temperatures); floods; transport accidents; and electricity system failures. These were all addressed within the relevant topics. During the construction phase, the risk of accidents would be managed via implementation of the CEMP, which would include details of the construction methodology and would	<u>Variation 1 & 2</u> As the 2014 EIA Regulations did not require the assessment of major accidents and disasters, the CWF ES (2015) does not include any conclusions or mitigation measures in relation to major accidents and disasters. During the construction phase, the risk of accidents would be managed via implementation of the CEMP, which would include details of the construction methodology and would confirm the schedule of works, a traffic management plan, any potential pollutants and the protocols for managing potentially polluting practices such as re-fuelling of plant, wheel washing and materials storage. All health and safety procedures set out for the construction of CWF would also be implemented for the construction of the proposed access. The design and construction of the proposed access track would follow all legal requirements for health and safety in particular those from the Construction Design and Management (CDM) Regulations. Contingency planning for peat landslide events will be undertaken at an early stage during construction planning and will be incorporated into the CEMP. <u>Variation 3 & 4</u> Due to the presence of peat deposits across parts of the STR 2 site, a Peat Landslide Risk Assessment was prepared. The Peat Landslide Risk Assessment demonstrates that the link track is located within areas determined to be either insignificant or significant zones of peat landslide risk ranking. Both the insignificant and significant zones are considered acceptable for development, assuming that suitable mitigation, monitoring and contingency measures are put in place as described in the STR 2 EIAR (in particular Appendix 10.B: Peat Slide Risk Assessment). These measures would be adhered to.	<u>Variation 1 & 2</u> No likely significant effects. Subject to mitigation measures and regulatory requirements. <u>Variation 3 & 4</u> No likely significant efffects. Subject to mitigation measures and regulatory requirements.

	confirm the schedule of works, a traffic management plan, any potential pollutants and the protocols for managing potentially polluting practices such as re-fuelling of plant, wheel washing and materials storage.	Severe weather and electricity system failures would be taken into consideration during the design of the Proposed (varied) Development. Flooding is considered under 'Water resources and flood risk' above. Transport accidents are considered within the Transport Assessment (**Annex C**).	
Climate Change	The requirement for consideration of climate change was introduced in the EIA Regulations in 2017 and is interpreted to include how the Proposed (varied) Development could contribute to climate change and how the Proposed (varied) Development has considered climate change in design. The first of these will depend on the type of development and the second relates to how resilient the Proposed (varied) Development is to the effects of climate change. The UK climate change risk assessment[14] details some of the hazards related to climate change of most relevance to the Proposed (varied) Development. The hazards include: • increased precipitation (heavier rainfall) leading to potential flooding and erosion; • higher extreme temperatures leading to risks associated with wildfire or risks to the grid connection; and • increased severity of storms with the potential for damage to plant and infrastructure. <u>Variation 1 & 2</u> The EIA for the CWF ES (2015) provided a greenhouse gas (GHG) assessment to consider the influence of the Proposed	<u>Variation 1, 2, 3 & 4</u> The Proposed (varied) Development variations are designed to support a potential route to market for Chirmorie Wind Farm, and therefore they would help in realising the carbon (GHG) emissions reductions associated with renewable energy. By increasing the rotor diameter and tip height the proposed variation would improve the carbon payback by increasing the potential energy yield from the site[16]. The changes to the access arrangements (variation 3 & 4) are considered to be negligible in the context of the carbon calculations for this site and therefore not considered to change the conclusion that the Proposed (varied) Development would have a beneficial effect for climate change in terms of realising a reduction in CO_2 emissions. The changes would not materially alter the 2015 conclusions, therefore the CWF will have a net beneficial impact by offsetting GHG emissions associated with fossil fuel sources of energy generation (while the bigger turbine would increase the generation, the carbon intensity of the grid mix is likely to reduce in the meantime). The vulnerability of the Proposed (varied) Development to climate change hazards is considered to be low on the basis that the design specifically includes embedded mitigation to ensure that significant effects are avoided or reduced to a tolerable level. The	<u>Variation 1 & 2</u> No likely significant effects. <u>Variation 3 & 4</u> No likely significant effects.

[14] URL: https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Scotland-National-Summary.pdf (accessed 24/3/2020)

[16] The carbon payback time for a wind farm is calculated by comparing the net loss of carbon from the site due to wind farm development, Ltot (t CO2 eq.), with the carbon savings achieved by the wind farm while displacing electricity generated from coal fired capacity, grid mix or fossil fuel mix.

	(varied) Development on climate change. The assessment was based on the Scottish Government carbon calculator[15] and considers the following: • total GHG emission savings with respect to emissions from different power generating sources; • GHG emissions due to production, transportation, erection, operation and dismantling of the wind farm; • GHG emissions due to the need for backup power generation; • GHG emissions due to change in fixing potential of peat land, loss of carbon dioxide stored in peat land, balanced against carbon saving due to restoration of habitat and loss of carbon-fixing potential as a result of forest felling. The CWF ES (2015) used the Carbon Calculator tool (version 2.9.0). The assessment found that net emissions from the Consented Development would be 79,627 t CO_2 equivalent (with minimum to maximum range of 39,181 to 348,398 tCO_2 equivalent). When considered against a grid mix of electricity generation the Consented Development would achieve a carbon payback of 1.1 years (with 0.4 years minimum and 7.6 years maximum). <u>Variation 3 & 4</u> Climate change was considered in the STR 2 EIAR (2018) in the predicted future baseline scenarios for landscape and visual; historic environment; ecology and ornithology assessments. The hydrology assessment included a 20%	Proposed (varied) Development is not within an area prone to flooding and all watercourse crossings will be designed to accommodate a 1:200 year (plus climate change) flood event. The Proposed (varied) Development will provide a Sustainable Drainage System (SuDS) for both the construction and operational phase, which will ensure that the volume, rate and quality of surface water run-off is not impacted. Resilience in the event of severe weather and fire is a core component to the wind farm design and turbine design. The Applicant would use a remote operational control system (controller and SCADA systems), which allow both automated and remote user shutdown in order to protect assets in the event of extreme conditions including extreme high wind or ice loading. It is noted that the site is not considered to be vulnerable to flooding and extreme heavy snow is also likely to be rare given the relatively low altitude of the site. With respect to protecting the safety of people, the Applicant operates to the highest standards for safety and health, including implementing strict protocols for risk assessment which includes consideration of severe weather, and site based 'dynamic' risk assessment which requires staff to stop work in the event that weather conditions become unsafe. Wind speeds are constantly measured by the nacelle based ultrasonic anemometers, which are permanently heated. There are typically two anemometers located on the nacelle roof, with redundancy that allows continued operation should one malfunction. The outputs from the anemometers are integrated into the controller and SCADA systems to inform and warn the operator. When wind speeds in excess of the cut-out wind speed (determined from the power curve) are experienced the turbine will enter an idle state by pitching the blades out of the prevailing wind. All turbine subsystems will then run in an auto mode configuration. This means the turbine is in a state ready for	

[15] URL: https://www.gov.scot/publications/carbon-calculator-for-wind-farms-on-scottish-peatlands-factsheet/ (accessed 24/03/2020)

	increase in the 1 in 200-year return period peak flow estimate as an allowance for climate change.	production until the wind speed falls below the level to cut back in, over a 10-minute average. When this occurs, the turbine is ready to resume generation and export power. The turbine yaw system will keep the turbine pointing upwind with the subsystems in the auto mode. In addition, rotor speed is constantly monitored to ensure that should any overspeed occur, then the turbine will automatically shut down by pitching the blades to stop position whilst the yaw remains active. Siting assessments and analysis of historic wind speed data will be used to determine the extreme wind speeds likely to be encountered on the site. The turbines proposed by the manufacturers will have been designed to operate within these conditions. Ice detection is performed by a software application, whereby ice build-up on the turbine blades is determined by comparing the actual performance data with the nominal turbine power curve. The software makes comparisons with pre-defined threshold levels or a low power (ice detection) power curve. When the performance levels drop below the reference thresholds an alarm is generated within the SCADA system to warn the operator. In this instance the system can be configured to pause the turbine or to continue operation at reduced power whilst displaying the level of icing severity. If the turbine is shut down by an icing event, then depending on the system installed it may be possible to carry out remote re-starting of the turbine when climatic conditions allow. Sometimes a manual start will be required. This will necessitate the operator going to the turbine, where a visual assessment of ice build-up can be made. When attempting to re-start the turbine it will be necessary to put an exclusion zone in place in case of any residual ice throw from the blades. In the event of fire, turbines are located a sufficient distance from settlements and scattered dwellings, such that there would be no significant risk to human health. The turbines are fitted with comprehensive fire detection and warning systems that are integrated to the control and SCADA systems to generate alarms,	

		alert the operator and control the shutdown of the turbine. Smoke and heat detectors are located in the high-risk areas; all electrical panels and controller cabinets, above the switchgear, above the generator and over the high-speed brake disk. Depending on supplier the transformer enclosure will be monitored by smoke and heat detection or by arc flash detection for immediate shutdown and removal of electrical energy. The system will also close off air vents and stop all fans to reduce air intake to a potential fire and to prevent smoke and/or gasses from being circulated within the tower/nacelle. The weather screen and housing around the machinery in the nacelle is made of fibreglass reinforced laminated panels with fire-protecting properties. The design includes fully integrated lightning and EMC protection. Both the nacelle and the steel tower act as a Faraday cage thus preventing fire induced by lightning. The blades are fitted with multiple lightning receptors that conduct to the tower via a slipring arrangement. Any excess grease or spilled oil are gathered in reservoirs to be emptied during scheduled maintenance. The high-speed brake system is shielded around the moving parts to ensure that any sparks generated will not spread into the nacelle. The use of flammable materials has been eliminated wherever possible by design and halogen free (low smoke) cables are deployed. For the reasons set out, impacts related to vulnerability to climate change hazards are scoped out of further consideration.	
Population and Human Health	<u>Variation 1 & 2</u> The area where CWF is located is generally remote and the density of dwellings low. The main population centres	<u>Variation 1 & 2</u> The conclusions of the CWF ES (2015) remain valid: it is predicted there would be no long term significant socio-economic effects on tourism within 20km of the site; on the productivity of the farm; from vehicle movements and traffic during construction and	<u>Variation 1, 2 3 & 4</u> Nolikely significant effects. The potential population and human health effects are

	surrounding the area are Barrhill, Pinmore, Pinwherry, Colmonell, Ballantrae, Cairnryan and New Luce. The tourism sector is significant to the local economy. Within 5km of the site Barrhill serves as a small tourism facility and Barrhill Holiday Park, Queensland Holiday Park and Kildonan Country House are tourism facilities. The A714 between Newton Stewart and Girvan is part of the Galloway Tourist Route, a designated National Tourist Route; there is a section of the Southern Upland Way south of the windfarm; and the C72 is used occasionally by tourists and locals in cars, walking and cycling. The site itself is crossed by a farm track which is used for farm traffic. The Cross Water of Luce catchment is used by anglers. Within 20km of the site other key tourist attraction include the Southern Upland Way; Galloway Hills Regional Scenic Area including a UNESCO Biosphere Reserve; Galloway Forest Park; National Cycle Network Route 7 and the National Byway Cycle Route. <u>Variation 3 & 4</u> Socio-economic impacts were assessed within the STR 2 EIAR. The local area has a declining and aged population with tourism and construction important to the economy. Three of Scotland's great trails, two National Cycle Routes, one local scenic pathway, one of Scotland's great railway routes and a number of Rights of Way and Core Paths pass within 15km of the Stranoch 2 site (and access route). Local attractions within 10km of the site boundary include: Glenluce Abbey; Glenwhan Gardens; Castle Kennedy Gardens; Penderry Hill; Green Valley Golf Academy and Craigiemains Home and Garden Centre.	decommissioning; on informal recreational pedestrian, cyclist and/ or equestrian users; and water quality and fisheries. No increase in the significance of effects to population and human health are anticipated as the proposed modifications would not result in any change in the way the Proposed (varied) Development would interact with socioeconomic receptors. All mitigation measures identified in the CWF ES 2015 will be adhered to. <u>Variation 3 & 4</u> The STR 2 EIAR concluded the impact on tourism; the local economy; rights of way and recreational users would be negligible and notes the region's main tourist attractions are located some distance from the site. The proposed variations for CWF are not predicted to materially change these findings.	considered to be marginal and not of a magnitude that requires assessment through EIA.

<table>
<tr>
<td>Shadow Flicker</td>
<td>As part of the CWF ES 2015, a qualitative appraisal was completed of the potential for shadow flicker at properties within 10 rotor diameters of the nearest wind turbine.

Chirmorie Farm is the closest inhabited property to the proposed wind farm development and the only dwelling within 2km of any of the turbines (CWF ES, Figure 5.1).

<table>
<tr><th>Wind Turbine</th><th>Distance (m)</th><th>Angle (from Turbine to Farmhouse)</th></tr>
<tr><td>T15</td><td>590m</td><td>130 degrees from North</td></tr>
<tr><td>T12</td><td>980m</td><td>115 degrees from North</td></tr>
<tr><td>T19</td><td>610m</td><td>78 degrees from North</td></tr>
<tr><td>T20</td><td>1,070m</td><td>56 degrees from North</td></tr>
</table>
Four wind turbines were identified within a distance equivalent to 10 rotor diameters from Chirmorie Farm as shown below.</td>
<td>The dwelling at Chirmorie Farm would not be occupied once the wind farm became operational although the farm would remain as a commercial property. Alternative accommodation would be provided for the current occupant (the farm manager). The potential for shadow flicker has therefore not been considered further since there would be no inhabited properties within 10 rotor diameters of the nearest wind turbine. No significant effects on shadow flicker were predicted as part of the CWF ES 2015.

Shadow flicker modelling (Annex C) was undertaken to assess the potential impact of the turbine modifications on Chirmorie Farm. Five turbines were identified as producing shadow flicker (within a distance equivalent to 10 rotor diameters from Chirmorie Farm), with turbines 12 and 19 producing the worst case scenarios.

<table>
<tr><th>Turbine</th><th>Easting</th><th>Northing</th><th>Days per year</th><th>Max hours per day</th><th>Mean hours per day</th><th>Total hours per year</th></tr>
<tr><td>12</td><td>220005</td><td>577223</td><td>89</td><td>0.6</td><td>0.35</td><td>31.2</td></tr>
<tr><td>15</td><td>220442</td><td>577198</td><td>17</td><td>0.11</td><td>0.07</td><td>1.2</td></tr>
<tr><td>16</td><td>219747</td><td>576835</td><td>17</td><td>0.45</td><td>0.29</td><td>4.9</td></tr>
<tr><td>19</td><td>220301</td><td>576694</td><td>55</td><td>0.88</td><td>0.73</td><td>39.9</td></tr>
<tr><td>20</td><td>220009</td><td>576216</td><td>15</td><td>0.41</td><td>0.25</td><td>3.7</td></tr>
</table>
</td>
<td><u>Variation 1</u>

No likely significant effects.

There will be shadow flicker caused by one additional turbine, however in the worst case scenario, this is less that 1 hour in a day and the modifications are not considered to have a significant impact in terms of EIA.</td>
</tr>
</table>

		Considering there is only one receptor with 10 rotor diameters and the worst case scenario is less than 1hour of shadow flicker in a day, the turbine modifications are not considered to have a significant impact. If any significant impact from shadow flicker on residential amenity were to occur appropriate mitigation will be defined and implemented which could include measures at the property (in agreement with the owner), planting or screening or other management of the relevant wind turbines.	
Traffic and Transport	The assessment for CWF is based on the assumption that there will be no overlaps in the delivery schedules / construction programmes for both CWF Site and STR1/STR2 wind farms. CWF and STR2 have grid connection dates separated by 12 months, which in turn means that the STR2 construction programmes would be scheduled to follow on from CWF. . The CWF ES traffic assessment did not identify any significant effects as a result of traffic movements during construction of the Chirmorie Wind Farm. The only change to the anticipated traffic flows stated in the ES, (due to the new proposed access) is the removal of the majority of wind farm construction traffic through Barrhill village. The diversion of this traffic onto an access track shared by 2 wind farm developments is likely to result in fewer adverse environmental effects arising from construction of the wind farm compared with those assessed in the CWF ES. The STR2 EIAR 2018 reported that the effects of wind farm related traffic can be classed as minor or negligible for the majority of receptors and these would be limited to the construction phase of the project. Some temporary moderate/minor effects would be experienced by users of U90w, C2w and U84w. The adverse effects would only be experienced by the very limited number of residents along and users of the U90w, C2w and U84w and would be given detailed consideration by the wind farm contractor management team through the provision of a Traffic Management Plan. In the longer term, it is noted that the safety of the affected roads would be enhanced through the provision of adoptable junction improvements and road strengthening/widening. An updated Transport Assessment (**Annex C**) was undertaken by Pell Frischmann (2020) to provide an assessment of the transport issues associated with combining the access arrangements for Chirmorie and STR 2 Wind Farms. Existing traffic data established a base point for determining the impact during the construction phase and was factored to future levels to help determine the effect of construction traffic on the local road network. The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed (varied) Development. During the construction of the Proposed (varied) Development, the associated traffic effects are predicted to be greatest on the U90w and U84w public roads. Whilst the increase in traffic is statistically significant, the increase in actual numbers is relatively small. No capacity issues are expected on any of the roads assessed due to the additional construction traffic movements associated with the Proposed (varied) Development as background traffic flows are very low and the road links within the study area are of reasonable standard.		<u>Variation 2</u> No likely significant effects. The potential impacts on the surrounding road network and residential environment from increased HGV and other traffic are not considerd to be of such significance as to merit assessment through EIA. The proposed variation can be adequately assessed through a Transport Assessment.

	Mitigation measures such as on-site borrow pits will reduce HGV traffic flows on the study area network and a traffic management plan would be required to control construction traffic in the interests of road safety and efficiency.		
Cumulation with other Development	Projects which would have similar infrastructure at application stage identified within the vicinity of the Proposed (varied) Development are: • the proposed 20-turbine Stranoch 2 Wind Farm which is located approximately 4.5 km southwest of the Proposed (varied) Development; • Arecleoch Windfarm Extension comprises of 13 turbines and borders the northern edge of the Proposed (varied) Development; and • Killgallioch Windfarm Extension comprises of 11 turbines and is located approximately 4km south east of the Proposed (varied) Development. All considered developments are shown in **Annex A, Figure 3.2.**	<u>Proposed (varied) Development</u> The only cumulative impacts highlighted as part of the CWF ES (2015) and the STR 2 EIAR were in relation to LVIA. As discussed in the LVIA section above, no significant effects (increase in existing or new) are expected as a result of the Proposed (varied) Development (variations 1-4). Since Stranoch 2 Wind Farm was previously consented (albeit for smaller turbine typology) and given that the proposed turbines at Arecleoch and Kilgallioch Wind Farms are extensions, it is considered unlikely that the arising cumulative LVIA effect would be significant. No significant cumulative effects in relation to noise are expected as all developments meet their respective planning condition noise limits. A Transport Assessment (**Annex C**) was completed to understand any potential issues associated with combining the access arrangements for CWF and STR 2 Wind Farms. CWF has a contracted grid connection of late 2022, with STR 2 contracted in late 2023 (subject to planning consent being granted). During the construction of the Proposed (varied) Development, the associated traffic effects are predicted to be greatest on the U90w and U84w public roads. Whilst the increase in traffic is statistically significant, the increase in actual numbers is relatively small. The construction traffic during the most intensive phase of the construction programme will be short lived. The surrounding road network however has sufficient capacity to accommodate the temporary construction traffic. A traffic management plan will be in place to control construction traffic in the interests of road safety and efficiency. The construction programmes of STR 2, Arecleoch and Killgallioch are staggered, and are expected to begin construction after completion of CWF. There is a small crossover between the end of	<u>Variation 1 & 2</u> No likely significant effects. The potential additional landscape and visual impact effects are considered to be marginal and not of a magnitude that requires assessment through EIA. The additional effects can be adequately assessed through the submission of a Landscape and Visual Impact Assessment. <u>Variation 3 & 4</u> No likely significant effects. Having regard to the minor scale of the proposal it is not considered that either the Alternative Construction Traffic Route or the location of the Proposed Borrow Pits, is likely to have significant effects that would require to be assessed through EIA.

		CWF construction and the start of STR 2, however no significant cumulative effects from construction traffic are expected. Considering the above factors, the Proposed (varied) Development is not predicted to increase any existing cumulative effects with respect to LVIA and no significant cumulative effects due to an increase in construction traffic are expected.	
Material Assets and Natural Resource Use	In order to reduce the need to import stone from a local quarry it would be necessary to include borrow pits on-site. The only road that is suitable for HGVs carrying stone is the U90w. Following completion of construction, borrow pits would be restored to ensure that the ground is stable and improve their visual appearance. Stone from Stranoch estate would be extracted and crushed on site to construct the 'spine' access. It is proposed to use the three borrow pits (**Figure 1.1**) which are closest to the spine road and they have been assessed as part of the EIA for the STR1 (and therefore consented) and STR2 s36 applications. All decommissioned materials would be stored on site in segregated piles. The principal contractor would provide method statements for the collection, storage and transportation of materials/waste. Where appropriate, materials/waste would be segregated on the Site in lockable skips or bunded tanks and transported to appropriate sites or recycling facilities in accordance with any required waste management licences. No materials would be burned on the Site. Hazardous waste would be held in a separate skip (or suitable bunded facility) and disposed of at a suitably licensed site. No waste would leave the Development Site until the appropriate waste carriers' licence and management certificates for the disposal site or transfer station have been inspected and authenticated by the relevant parties. The Proposed (varied) Development would not result in any significant natural resource use during construction and the operational track would not require any significant natural resource use.		Variation 1, 2, 3 & 4 No likely significant effects subject to mitigation measures.
Waste	All waste arising during the construction phase would be managed in accordance with waste regulations. A Site Waste Management Plan (SWMP) would be used to manage the construction waste arising, and would establish responsibilities for waste management, monitor waste generation, manage waste segregation into recyclable waste streams and set targets for the diversion of waste from landfill. Operational wastes would be limited to low volumes of wastes produced as a result of routine maintenance activities. No significant effects would be likely to arise as a result of waste generation during construction or operation.		No likely significant effects subject to mitigation measures.
Pollution and Nuisance	A Construction Environmental Management Plan (CEMP) will be developed and implemented, which will ensure pollution prevention measures are in place to protect existing drainage channels, site hydrology and soils. Liaison with landowners and		No likely significant effects subject to mitigation measures.

	local residents has, and will continue to be, carried out to ensure that minimum disruption occurs throughout all stages of the development and construction of the project. There would be no likely significant effects as a result of pollution, nuisance, lighting, heat or radiation during construction or operational phase of the Proposed (varied) Development.	