

Al Appendix 3A Interim Response Report









Technical note: Stornoway Wind Farm - Interim Response Report

1. Introduction

The Section 36 application for the proposed Stornoway Wind Farm, near Stornoway on the Isle of Lewis, was submitted to the Energy Consents Unit on 21 May 2019 by Stornoway Wind Farm Limited (SWL ('the Applicant')). A number of consultation responses have been received in relation to the development proposals. The purpose of this technical note is to provide a summary of the consultation comments received to date; detail the Applicant's response; and indicate where it is proposed to provide Additional Information (AI).

It is anticipated that the AI would be submitted in January 2020.

2. Summary of Responses

Consultee	Summary of Comments	SWL Response
BT 29/05/2019	Turbine 7 may cause interference to BT's current and presently planned radio network. 8 links are affected. They would object to the development of this wind farm if it strongly interfered with the existing BT radio links.	Correspondence with BT, which is included in Appendix A , has confirmed that BT would be prepared to accept the current location of T7 subject to a micro-siting restriction so there is no movement towards the affected link. SWL can confirm they would be happy to accept this as mitigation and for this to be conditioned.
Scottish Water 30/05/2019	Scottish Water has no objection to this planning application; however, notes that according to their records, the development proposals impact on existing Scottish Water assets. The applicant must identify any potential conflicts with Scottish Water assets and contact our Asset Impact Team.	SWL acknowledge that no objections have been raised. Scottish Water mapping was purchased during the EIA process, which identified Scottish Water infrastructure at the site entrances. SWL would be happy to agree a condition requiring that an appropriate means of crossing the infrastructure is agreed with Scottish Water.
Fisheries Management Scotland (FMS) 31/05/2019	Our remit is confined to alerting the relevant local DSFB / Trust to any proposal. The proposed development falls within the district of the Western Isles District Salmon Fishery Board, and the catchments relating to the Outer Hebrides Fishery Trust. It is important that the proposals are conducted in full consultation with these organisations. We have also copied this response to these organisations.	SWL note the comments made by FMS and as noted below, has considered comments made by Western Isles District Salmon Fishery Board, however no comments have been submitted by the Outer Hebrides Fishery Trust to date.

Table 2.1 Summary of Comments Received and SWL Responses



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Consultee	Summary of Comments	SWL Response
	We would recommend that the guidelines in the advice developed by FMS, in conjunction with MSS, regarding impacts on migratory fish species is fully considered throughout the planning, construction and monitoring phases of the proposed development.	
NATS 03/06/2019	 Three different technical impacts are anticipated: Degradation of the radar-FFM link Reduction in Carried to interference levels on the air-ground-air communications Degradation of the Sandwick-Eitshal Microwave link. The reduction in Carrier to interference levels have been deemed to be acceptable however the risk to operation of the 2 links between Sandwick and Eitshal are sufficient for NATS to object to the proposed development. 	NATS En-Route Ltd (NERL) has indicated that the proposal would conflict with current safeguarding criteria. As a result, is objecting to the Proposed Development due risk to operation of 2 links between Sandwick and Eitshal. NATS provided details of a microwave link running across the Development Site as part of its response to the aviation consultation. This link runs within 20m of the proposed location of turbine 8 and it has not been possible to relocate the turbine. Further discussion with NATS will be undertaken and it is likely that mitigation would be proposed and secured through a planning condition.
JRC Wind Farms 06/06/2019	All of the turbines affect links crossing the development site.	SWL has sought to get confirmation from JRC that the proposed layout has addressed their concerns but has not received a response to date. However, the coordinates and dimensions of the proposed wind turbines have been provided and SWL would be willing to agree a condition regarding mircositing / directional restrictions relating to turbines 1, 4, 14 and 31; if required to mitigate any potential effects on existing telecommunications links.
MOD 07/06/2019	The MOD has no objection to the proposal.	SWL acknowledges that no objection has been raised. No further action is required.
Western Isles District Salmon Fisheries Board 07/06/2019	Culverts will be used where a crossing is required and the river crossing is deemed to have low environmental sensitivity. No detail is provided as to what process will deem a crossing to have low environmental sensitivity although WIDSFB would request that the Outer Hebrides Fisheries Trust (OHFT) are consulted regarding sensitivities of local fish populations at individual crossings. The construction of watercourse crossings will avoid salmonid migration and spawning periods, however it will also be necessary to avoid the period where salmonid eggs will be incubating in the substrate of the river The relocation / rescue of fish species would also be required in the immediate area of crossings, WIDFSB would suggest OHFT are best placed to carry out such works.	 SWL would be willing to agree: A condition requiring a methodology for defining low environmental sensitivity to be developed in consultation with the OHFT; and A condition requiring the construction of watercourse crossing to avoid salmonid incubation, migration and spawning periods requiring this as part of a CEMP. SWL would be happy to engage with OHFT regarding the relocation / rescue of fish species.



Consultee	Summary of Comments	SWL Response
Farrpoint 10/06/2019	Farrpoint has a technical objection to this proposal because the assessment indicates that Wind Turbine(s) of the specified details, located on the proposed coordinates, would be likely to have an impact on the Connected Communities Network. A reduction in the height of the proposed turbine is unlikely to remove this impact.	It appears that Farrpoint has assessed the 33- turbine layout that was presented in the Scoping Report. The email correspondence included at Appendix B illustrates that Farrpoint have been consulted on the project since May 2018, with the most recent correspondence taking place in February 2019 in relation to the final layout proposals which were taken forward in the s36 application. The email correspondence shows that Farrpoint have no objection to the proposed site layout, subject to the micrositing allowance for T20 being reduced to 20m. SWL can confirm they would be happy to accept this as mitigation and for this to be conditioned.
Transport Scotland 17/06/2019	Transport Scotland has no objection to the proposed wind farm in terms of environmental impacts associated with increased traffic.	SWL acknowledges that no objection has been raised. No further action is required.
Scottish Forestry 20/06/2019	Scottish Forestry objects on the grounds of unacceptable woodland loss. Forestry was scoped out of the EIA Report, and the Forestry Note (Appendix 9J) doesn't provide the necessary level of information to allow for an informed decision on area of compensatory planting required. Peat assessment results (both depth and condition) alongside yield class assessment of the trees present on site are necessary to determine whether or not the trees would need to be replanted once harvested, if no development on the site was proposed. The Applicantfails to provide information on which the decision to replant only unspecified percentage of the 41.4ha of woodland to be removed was based. The Forestry Note contains no yield class assessment of the existing conifer woodlands. The accuracy of peat depth assessment for afforested areas if questions as very few peat depth measurements were taken out-with the turbine or access track footprints. To remove its objection, Scottish Forestry seeks that the Applicant proposes compensatory planting of 41.4ha, area equal to that of woodland removal. Any reduction in compensatory planting area needs to be justified by results of assessment of existing conifer woodland (yield class) and peat assessment – both depth and conditions. Once the area of compensatory planting is agreed, Scottish Forestry will seek that it is condition of approval, and that it is in place prior to construction works commencing.	In accordance with the UK Forestry Standard (UKFS) and The Scottish Government's Policy on the Control of Woodland Removal, compensatory tree planting is required to fully offset loss of coniferous plantation woodland within the Development Site (in this case 41.1ha). Due to the concerns regarding the afforestation of the high quality bog habitat on site, and uncertainty regarding the interaction between the existing failed forestry and important protected birds on sites, it is considered unlikely that the woodland to be lost can be replaced in its entirety on site. Subject to feedback from SNH and the RSPB regarding the importance of particular habitats on site, it is considered that circa 10ha of woodland will be replanted on site as part of the broader habitat enhancement works. These will be identified in the Habitat Management Plan as it develops should consent be granted. An updated outline Habitat Management Plan is included as part of the Al. Lewis Wind Power will work with Scottish Forestry to develop a compensatory planting plan to ensure that any woodland that cannot be replaced on site will be delivered on suitable land off-site. A suitably worded planning condition should be attached to any grant of consent to ensure the required compensatory planting is delivered prior to works commencing on site.



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Consultee	Summary of Comments	SWL Response
	Compensatory planting might be delivered off site, therefore if no suitable area is available within proposed development's site, other locations should be proposed subject to Forestry (EIA) (Scotland) Regulations 2017.	
	Scottish Forestry will be happy to work with the Applicant to develop a suitable compensatory planting plan.	
Marine Scotland Science 24/06/2019	MSS welcomes the updated electrofishing surveys and water quality monitoring. They advise that similar surveys are carried out at least 12 months prior to construction commencing, during and for a least 12 months after completion of construction. MSS suggest an additional sampling site is selected downstream on the River Creed to monitor potential impacts on aquatic biota associated with the construction of the access track in the east of the development site. They advise that the potential cumulative impacts of adjacent developments on water quality and fish populations should be considered in the selection of control sites.	SWL would be happy for the requirement for an integrated water quality and fish population monitoring programme to be conditioned and details to be confirmed pre-construction.
Visit Scotland 25/06/2019	Visit Scotland considers full consideration should be given to the Scottish Government's 2008 research on the impact of wind farms on tourism. They recommend that any potential detrimental impact of the proposed development on tourism – whether visually, environmentally and economically – be identified and considered in full. They advise that an independent tourism impact assessment should be carried out.	 SWL consider that the Visit Scotland Response is fully addressed within the submitted EIA Report. An assessment of the potential effects on population health, employment and economy, tourism and recreation and land use of the proposed development was included within Chapter 14: Socio-Economics of the EIA Report. The assessment set out in Chapter 14 draws on the findings of the following EIA Report Chapters in reaching conclusions regarding the potential for wider socio-economic, tourism or recreational effects to arise: Chapter 6: Landscape and Visual Impact Assessment, which includes an assessment of the effects of the scheme on settlements, transport and recreation routes and the effects of lighting is addressed in Appendix 6D: Night Time Visual Assessment; Chapter 7: Historic Environment, which addresses the potential effects of historic environment receptors;





Consultee	Summary of Comments	SWL Response
		 Chapters 9 and 11: Ecology and Geology, Hydrology and Hydrogeology respectively, which consider the potential effects on water levels, flow and quality and which are considered in Chapter 14 in terms of predicted effects on any water related recreational activities; Chapter 12: Noise, which identifies that no
		significant noise related effects as a result of the Proposed Development;
		 Chapter 13: Traffic and Transport, which considers the effects on the amenity of local residents and the local community due to traffic generated during the construction and operational phases of the Proposed Development; and
		 Chapter 15: Shadow Flicker, which concludes that no shadow flicker effects are predicted to arise.
Historic Environment Scotland	HES are content that sufficient information has been provided in the EIA Report and do not wish to object to the proposed development.	SWL acknowledges that no objection has been raised. No further action is required.
27/06/2019		
Highlands and Islands Airports Limited 27/06/2019	The development would infringe the safeguarding surfaces for Stornoway Airport. Due to the height and position of the development, a steady red omnidirectional aviation warning light of 200 candela would be required on the hub height of the turbines. Provided that this condition is met HIAL would not object to this proposal.	SWL accept the need for Aviation lighting; a planning condition should be attached to any consent requiring the installation of lighting in accordance with HIAL's requirements.
RSPB Scotland 27/06/2019	RSPB Scotland objects to this application on the basis that the ornithological survey work and vantage point work presented in the EIA and informing the Habitats Regulations Appraisal is incomplete. The EIA only includes up to date ornithological survey data covering one year rather than two full years of survey. Based on the information presented in the current version of the EIA we wish to raise several concerns. If an assessment of two full years of data predicts impacts similar or greater than those	 SWL acknowledges that only one year of ornithological survey work is presented in the EIA Report (October 2017 – September 2018) and can advise that a second year of surveys was completed in September 2019. This survey work will be provided to ECU and consultees as AI in January 2020. In relation to ornithological aspects, the AI will comprise: Replacement Ornithology EIA Report Chapter, detailing the results of the revised assessment / cumulative assessment of all bird
	presented in the current EIA, it is likely that we will maintain our objection unless impacts are reduced through modifications of the proposal particularly in relation to the predicted impacts on hen harrier.	 survey results covering 2017-2019; Non-breeding Bird Report 2018-2019, detailing the survey effort and results from October 2018 – March 2019;
	Bringing this proposal to planning before the ornithological survey work is complete is premature and we would expect the developer to be prepared to make changes to the proposal once the ornithological survey work is complete to reduce or minimise likely impacts.	 Breeding Bird Report 2019, detailing the survey effort and results from March – September 2019;



Consultee	Summary of Comments	SWL Response
	The following further information is requested to inform an appraisal of impacts and possible mitigation once the full two years of data is incorporated into the EIA:	• Confidential Appendix , presenting data on nest locations and flights activity associated with sensitive bird species for the period October 2018 – September 2019;
	 A comparison of ornithological impacts for the consented 36 turbine Stornoway Wind Farm and the current proposal; 	• Collision Risk Model (CRM) Appendix . A CRM will be carried out covering the period August 2018 – August 2019, representing the
	 Population viability modelling of the impacts from the Stornoway Wind Farm on hen harrier at the scale of the Lewis population. 	 second years CRM; Population Viability Assessment (PVA) Appendix. A PVA will be carried out for red- threated diver code and white toiled
	Should Scottish Ministers be minded to consent the application as submitted, without prejudice to our objection we recommend that the habitat management plan needs to be much more ambitious than that currently proposed to further mitigate impacts on her barrier in particular	eagle. A PVA will also be undertaken for the Isle of Lewis hen harrier population. We will engage with RSPB to confirm our approach and the methodology to be used for the hen harrier PVA;
		 Habitat Regulations Assessment (HRA) Appendix. A revised HRA will be prepared to include results for the 2019 breeding bird results and 2018/19 non-breeding bird results;
		• Outline Habitat Management Plan (OHMP). Further detail will be developed in consultation with SNH, RSPB Scotland and the Peatland Action Officer and a revised OHMP will be presented. It is anticipated that he OHMP would be a working document, further developed should consent be granted;
		• Ornithological Impacts Comparison Assessment will be presented as an appendix to the Planning Statement.
SEPA 02/07/2019	SEPA objects due to a lack of information on the following issues:	
	1.2 ¹ It is not clear whether the blanket bog will be active and regenerating following development. Appendix 9G states that when blanket bog has new drainage ditches created adjacent to it, it will "result in a lowering in the water level and losses of bog specialist plant species being replaced by species that can tolerate drier conditions". It is therefore not clear whether the temporary / indirect habitat loss will result in the peat bog and wetlands no longer sequestering carbon, or if this may alter sequestration potential across larger parts of the bog, resulting in a much larger carbon loss over a much longer time period.	The Ecological Impact Assessment (EcIA) presented in Chapter 9 of the EIA Report has been undertaken on the basis that the plant communities within the site are in very good condition with active peat forming across most of the site. The most sensitive blanket bog communities were identified and avoided as far as possible. Carbon sequestration is expected to be unaffected across most of the bog, although it is likely that there will be some reduction in localised areas. Potential reductions in peat excavation will be considered further within an updated PMP as part of the AI. The carbon payback calculator will also be updated to quantify the effect of any likely changes in carbon sequestration.

¹ Number denotes paragraph numbering in SEPA's consultation response.



Consultee	Summary of Comments	SWL Response
	2.2 The Peat Management Plan presents average peat depths and average range of peat depths, while the only peat depth survey submitted is an interpolated peat depth survey (Figure 3a-3h). Further to this, the supporting site infrastructure (substations, compound/laydown areas, borrow pits etc) has not been overlaid on these peat depth maps. We therefore object until a peat depth survey is provided which shows the depths of individual probing points at an appropriate scale (such as the scale presented in the Peat Probe Locations Figure 2a-2h) of the Peat Management Plan, or larger) and includes information on all proposed temporary and permanent infrastructure.	A figure will be produced showing the peat survey point depth data to a scale that is similar to that of the Peat probe locations figure (2a-h). This figure will form part of the update Peat Management Plan (PMP) and will be provided in the Al.
	2.3 Figures 3.2A-3.2H (Indicative Peat Storage Areas) are not readable and we object until this information is resubmitted in a clearer format.	SEPA may have been issued with a low-res DVD version of the application documentation or have viewed a low resolution version of the documentation on line. A high-res DVD of the EIA Report is provided with this IRR for completeness. However it should be noted, that some changes to the EIA Report will be carried out as part of the AI submission.
	2.4 We have compared the NVC survey results with one accompanying a recent planning submission which overlaps this current site boundary and the results suggest that the surveys undertaken eight and nine years ago may no longer reflect the quality or sensitivity of the habitats present. This has the potential to significantly alter the results of the EIAR and therefore we object until the NVC survey and conclusions of the EIAR are updated to reflect the current site conditions.	It is not entirely unexpected that there is likely to be some shift in the type and distribution of specific plant communities, and surveyors rarely come up with exactly the same interpretation of results when carrying out an NVC survey so this is likely to account for some differences. The surveys in 2010 and 2011 recorded a healthy suite of bog communities and it remains SWL's view that this baseline is unlikely to have changed substantially within the past eight to nine years. Carrying out a further NVC survey would not change the level of sensitivity allocated to the bog habitat, nor would it change the level of assessment identified in the EIA Report, which is considered to be significant. Furthermore, the Scoping report (July 2018) at Section 8.3.2, and the response from SEPA (31 July) at section 1.4 confirmed that the existing NVC would be appropriate. We therefore do not propose to submit a further NVC,
	3.1 While Section 3 of the EIAR describes the infrastructure, it has not suggested that environmentally better alternatives have been considered. In such close proximity to Stornoway we would expect alternative locations to be considered, including locating supporting infrastructure on adjacent agricultural land, along existing roads, neighbouring business parks and industrial areas and by utilising existing quarries.	This proposal represents the re-design of a consented scheme. If the proposed development is consented it would allow SWL the option of which scheme to be construct.



wood.

Consultee	Summary of Comments	SWL Response
	We therefore object until reasonable alternatives have been considered, in which we would expect supporting infrastructure to be sited on previously disturbed lands, thereby avoiding deep peats and wetlands.	Options to move infrastructure off-site are minimal; although opportunities to limit requirements for on-site storage infrastructure have been incorporated into the proposed development, and further amendments to minimise onsite infrastructure has been identified. These amendments will be set out in the Al submission
		The following measures, to minimise Peat disturbance were considered when finalising the proposed development: Minimize track width;
		 Detailed site survey to site infrastructure on areas of shallowest peat;
		 Selecting borrow pit sites and time their use so that they are dual purpose when possible such as the main site substation (ie siting infrastructure on areas of previously disturbed ground); and
		 Minimise the number of passing places and using on-site traffic management;
		 Rock Anchor foundations.
		It is important to note, as a result of the adoption of the above measures, that the amount of turbines, length of access tracks, and amount of associated excavations have all reduced when compared with the previously consented scheme.
		Through further optimisation we have now developed the design sufficiently to allow both the secondary substation areas, and all of the proposed laydown/storage areas, to be removed and therefore reduce the area of disturbance required. The removal of these storage/laydown areas mean that the current scheme has no separate storage areas for turbine components on site. The crane hardstanding which is essential for the installation of the turbines would be used to temporarily store turbine components as well as for lifting operations. Turbine components would be delivered straight to each turbine location. This is to minimise double handling, additional storage requirements and traffic movements within the site (minimising emissions from vehicle movements).
		Consideration during the development phase was given to reducing the track widths to less than the 5m wide usually specified on wind farms. However, the proposed turbines at Stornoway would be among the largest ever installed on an onshore wind farm un the UK.



Consultee	Summary of Comments	SWL Response
		The size of the individual components will also be larger than many of the components transported to wind farm sites in the past. The size of cranes required will also be some of the biggest used for onshore wind sites to date.
		To reduce track widths as component sizes increase would greatly increase the risk of a vehicle leaving the track due to the reduced margin for driver error. The consequences and associated works required to recover a turbine delivery vehicle that has driven off the track and become stuck in the adjacent peat would be significant. This would result in extra emergency infrastructure and disturbance to surrounding ground. There is also a corresponding health and safety risk which would increase as a result of reducing track widths. Tracks and turning heads have therefore been reduced to the minimum safe width and area.
		Details of these savings are set out in the AI (in the Peat Management Plan section, and a comparison with the consented scheme will be located within a planning statement addendum.
	3.2 While alternative locations for borrow pits have been considered within the site boundary, no alternatives have been considered for utilising off- site aggregate sources. There would be significant environmental benefit in this case to utilising existing quarries. We note that Marybank Quarry is an active quarry site which supplies aggregate and is located adjacent to the proposed site entrance. We object until this approach is amended.	This proposal represents the re-design of a consented scheme; that if consented would allow SWL the option of which scheme to be constructed. It is important to note that the number of on-site borrow points have been reduced from 7 to 5 compared with the consented scheme.
		Consideration is always given to sources of aggregate for the construction of the site infrastructure of the wind farm. Factors such as availability of suitable material on site, traffic movements and cost are all considered to come up with the most practical option.
		At Stornoway Wind Farm, the initial site access would be constructed using imported aggregates from a local quarry (potentially Marybank), which has reduced the number of onsite borrow pits compared to the consented scheme. Once the main construction works progress, the quantity of stone required is such that even if it were all sourced from the quarries, the supply may not be able to cope with the demand as the aggregates are needed at a rate of up to 2500t per day during the peak construction works. This could amount to between 200-250 HGV movements on the public road network each day By using borrow pits on site, this reduces vehicle numbers on all parts of the public road network by over 80% (as set out in section 13.1.5 of the EIA Report.



Consultee

Summary of Comments

SWL Response

In addition to this, vehicles are unlikely to be arriving at the site evenly spaced throughout the day, and in practice it is likely that there would be large number of HGV arriving to the site in early morning to ensure that the stone is available for use that day. This is because laydown areas have been minimised, and the construction operations are designed to operate as much as possible to 'just in time' thus minimising the need for storage in areas of peat.

The use of on-site borrow pits would also mean that the amount of HGV movements on the A959 would be far less than they would be if all aggregates were imported and therefore disruption to road users and local residents would be minimised. Further benefits include a reduced haul for the aggregate, thus minimising the use of diesel engines and reducing reliance of this fossil fuel resource and air quality immissions.

In addition to the above, tracks have been designed to take a certain number of Equivalent Stand Axle loads (ESAL). The ESAL's influence the depth and makeup of the tracks themselves to a degree. The number of vehicle movements on the tracks has a direct impact on their design. The greater the number of vehicle passes, the greater the depth and quantity of aggregate required to construct the track. If all the aggregate was imported, from the site entrance, then loads that would otherwise only have to be hauled short distances will have to travel all the way across site. From an environmental point of view our aim is to always minimise movement of materials to keep vehicle noise, dust, dirty runoff water etc. Therefore the use of evenly spaced borrow pit locations reduce the distance required to be travelled by HGVs within the site.

Furthermore, the cost of importing aggregates rather than using on site borrow pits can be more than double the cost of using site won aggregates. If all the aggregates were imported from off-site sources, it is likely that the project would not be financially viable.

We trust this is sufficient information to explain why borrow pits remain an integral part of the proposed development.

3.3 The development proposes 28.7km of new access track. Due to the amount of deep peat and sensitive habitats, including the need to maintain hydrological pathways to these habitats, we would expect as much of the access track to be floated as possible.

The proposed new access tracks have been designed by SWL Construction Team to reflect the appropriate construction methodology as determined by underlying ground conditions. The Construction Team have experience of similar ground conditions on sites such as Corriemoillie and Dorenell in the Highlands, on areas of good quality peat.



Consultee

Summary of Comments

We note that floating tracks are proposed over peat depths greater than 1m; however, Figure 3.1 demonstrates that there are numerous very short sections of alternating cut and floating track side by side over short distances. It is unclear whether such design will be practicable and it is likely that any changes to this will result in changes to excavated peat volumes. We therefore object until further information is provide that demonstrates that the punctuated change in road type throughout the development will be achievable and practicable.

SWL Response

The Construction Team has advised that in their experience of constructing wind farms in environment such as Stornoway, problems for track integrity arise when constructing floating roads on peat of less than 1m in depth hence the alternating sections of excavated and floating roads in the proposed design.

The firmer underlying ground conditions are not suitable under load and the thin layer of peat can be displaced under wheel loading to the sides or forced upwards in the middle, often causing failure of the membrane and subsequently the track construction can be contaminated with peat. This results in sections having to be dug out. In more serious cases, there have been incidents where vehicles have tipped over because of failed membrane.

It is possible to transition from one track type to another over short sections, whilst still adhering to the guidance document 'Floating Roads on Peat' (Forestry Civil Engineering & SNH, 2010). In some circumstances track design can transition from cut and fill, to punched, to floating over very short distances, and engineers react to the ground conditions on the site on a meter by meter basis. Notwithstanding this, the detailed peat probing gives a clear indication of the type of track that would be suitable, and the proposed development has been designed on this basis.

The track design would be developed further following detailed design and ground investigation and SWL would be happy for this matter to be conditioned and details to be confirmed pre-construction.

The track type layout that has been submitted is a concept design that will be developed further by the successful Civil works contractor in consultation with the EcoW, with priority given to ecological, drainage and peat considerations. The ECoW would be involved in the walkover of the route prior to final design details being agreed so that ecological constraints are observed. As the peat excavated has to be removed and taken to the point of deposition by the civil contractor, it is not in their interest to remove more than is absolutely necessary and they will ensure that the design chosen is the most practical construction method for each area.

3.5 While we welcome that rock anchorage / cage foundations have been considered as an alternative to gravity based foundations to minimise the quantity of peat required to be removed, it appears that the turbines located on the deepest peat do not benefit from this mitigation.

Piled foundations have been considered but have been discounted due to the potential for relatively shallow bedrock. Piled foundations require the individual piles to be able resist tensile forces exerted to them by the rest of the foundation. Piles usually transfer the tensile forces to the ground via 'skin friction' which comes from the contact of the pile with the surrounding soil.





Consultee	Summary of Comments	SWL Response
	It is not clear why this is the case, and we would expect these turbines to utilise a pile foundation if rock anchor / cage technology is not possible. We therefore object until all turbines locations are re- assessed to demonstrate minimisation of peat excavations through measures such as re-siting of the turbines or utilising pile foundations.	If the piles are not long enough (i.e. if the bedrock depth dictates this) then there is not enough skin friction generated and the piles would pull out of the ground rather than resist the tensile forces. Furthermore, the bedrock in site is Lewisian Gneiss, which is very hard and piling into it is impractical. For this reason, traditional gravity or rock anchored foundations have been chosen as the most suitable foundation option.
	3.6 We would welcome clarification on whether the different types of rock anchor foundations will impact on the potential excavation volumes presented in Appendix A.	SWL can confirm that different excavated volumes we used in the peat volumes spreadsheet which is presented in Appendix A of the PMP (Volume 4, Appendix 9H of the EIA Report).
	3.7 A nearby similar scheme has proposed vibro- compaction floating crane pads, as well as floating all of their access tracks, which would significantly minimise impacts on peat. Could this type of mitigation be investigated for this development?	We have had the possibility of virbro-compaction reviewed by two Geotechnical Engineers. We note that Vibro-compaction is generally suitable for granular soil (medium sand to medium gravel). This technique is not normally used in cohesive soils (clay and silt or peat) and we have not seen any proven works where it has been used in peat. There has been some research carried out on vibro compaction in peat but using geogrid / stone columns such as "a behaviour of reinforced vibro compacted stone column in peat". We would consider this is only the research and not widely comfortable being accepted. In particular, we are not aware of any soil mechanic principles/equation to support this design methodology.The crane work is a high-risk activity both in health and safety and commercially as the consequence of crane turnover is extremely high.Peat can also be extremely compressible, once it reaches the plastic point, the settlement will keep going with minimis resistance eventually causing geotechnical failure. The crane platform or working platform design should follow the industrial best practice and contract requirements including Eurocode 7 and BRE 470 plus additional serviceability (settlement) checks where appropriate.We also note that the construction of the crane pads must be to a specification accepted by wind turbine manufactures and note that "floating" style construction of the crane pads would have a high potential to be rejected by the turbine supplier, and guidance from Turbine suppliers is consistently that floating road principal must not be used for the Hardstand area.We therefore consider that type of mitigation cannot be used for this development on the grounds of health and safety, design requirements and contractual adherence.



Consultee	Summary of Comments	SWL Response
		The use of floated roads is proposed on site where the peat depth is greater than 1m, otherwise the tracks would be excavated and backfilled. The LWP Construction Team has advised that in their experience of constructing windfarms in environments such as Stornoway, problems for track integrity arise when constructing floating roads on peat of less than 1m. The firmer underlying ground conditions are not suitable under load and the thin layer of peat can be displaced under wheel loading to the side or forced upwards in the middle, often causing failure of the membrane and subsequently the track construction can be contaminated with peat. This results in sections having to be dug out.
	3.8 We note that dewatering is likely to be required for the construction of the turbine bases which may then require pumping into settlement lagoons. Lagoons at every turbine location will require a sizable footprint and will likely result in further disturbance to peat and potentially impact sensitive wetland habitats. Their siting should be considered at the planning stage in order to ensure adequate space is achievable and avoidance of constraints is appropriately considered. We therefore object until further information on whether dewatering will require settlement lagoons and, if so, the size as well as location of the lagoons to be provided on a site plan overlaid on NVC and peat depth surveys.	The design for dewatering, collection and settling of suspended sediment (i.e. use of silt traps, fences, straw bales or lagoons) will be developed during the detailed design should consent by granted for the Proposed Development and would be detailed and agreed with SEPA as part of the Construction Site Licence. As stated in paragraph 11.8.44 of Chapter 11 of the EIA Report, it is proposed that dewatering activities are designed and implemented in consultation with SEPA on a foundation-specific basis following completion of detailed ground investigations and micro-siting prior to construction. SWL would be happy for this requirement to be conditioned and details to be confirmed pre-construction. The HMP will include habitat restoration to compensate for such potential effects.
	4.2 We note that the estimated peat extraction volume is estimated to balance exactly with re-use proposals. Our experience with many other projects on peat is that estimations of peat extraction volumes are often lower than predicted. SEPA therefore objects until the PMP is amended to set out more realistic volumes of extracted peat and options for its management.	There is no guidance on putting in a buffer to address any potential increase in peat extraction volumes. We will consult with SEPA to identify a factor to apply which would produce more realistic volumes of extracted peat based upon their experiences elsewhere. These figures will be used as the basis for preparing an updated PMP and carbon calculations for submission in the AI.
	4.3 We note that much of the habitats consist of bog pools and that peat at this location is likely to be very wet and unconsolidated. We object until the PMP is amended to identify what options for extracted peat are should much of the peat prove not suitable for use in restoration.	In the absence of detailed site investigations, the condition of the peat is unknown. Bog pools and other areas where peat is likely to be very wet and unconsolidated will be avoided where possible. However, SWL notes SEPA comments, and will present options for the use of excavated peat of varying condition in the updated PMP that will form part of the AI submission.





Consultee	Summary of Comments	SWL Response
	4.4 We would expect to see phased restoration of borrow pits with the use of impermeable cell bunds which can be sequentially filled and then overtopped with a layer of acrotelmic peat turves. We would therefore ask that the finished profiles or a sample drawing of this methodology is provided.	This information will be providing as part of the Al.
	5.1 It appears that there are very few opportunities for habitat compensation or peatland restoration on site due to the habitat being in such good condition. The PMP needs to be revised to address these apparent limited opportunities.	SWL notes SEPA's comments, which will be addressed in the updated PMP and HMP that will form part of the AI.
	6.1 Section 2.6.3 of Volume 2 of the EIAR states that "if a predicted future is more likely to occur than the current baseline it is used for this assessment". It then states that "in this case, the current baseline is used for the assessment as it is anticipated that current land use management would continue and it is therefore reasonable to assume that the future baseline would be similar to the current baseline". We do not agree with this assessment of the current or predicted baseline. The results of the of the 2018 NVC survey recorded more areas dominated by M17a (sensitive habitats) than the 2010/2011 survey, suggesting that the habitats within the proposed development area are actively re-generating and improving. If the baseline from 2010/2011 to 2018 has improved, it would conversely be reasonable to assume that the future baseline could also improve. We therefore object until this information is revised utilising modern NVC survey results.	The Ecological Impact Assessment (EcIA) presented in Chapter 9 of the EIA Report has been undertaken on the basis that the plant communities within the site are in very good condition with active peat forming across most of the site. The most sensitive (high quality) plant communities were identified and avoided as far as possible. As stated in response to paragraph 2.4, it is not entirely unexpected that there is likely to be some shift in the type and distribution of specific plant communities, although surveyors rarely come up with exactly the same interpretation of results when carrying out an NVC survey so this is also likely to account for some differences. The surveys in 2010 and 2011 recorded a healthy suite of bog communities and it remains SWL's view that this baseline is unlikely to have changed substantially within the past eight to nine years. Carrying out a further NVC survey would not change the level of sensitivity allocated to the bog habitat, nor would it change the level of assessment identified in the EIA Report, which is considered to be significant based on the existing or future baseline.
	7.1 The EIAR states that battery storage facilities will be required as part of the substation compound. A site plan is required which shows that the battery storage area is bunded and has appropriate drainage. Further information is also required on the environmental risks associated with battery storage that need to be mitigated for. While we are happy for aspects of this to be included within the CEMP, we would expect this infrastructure to also avoid sensitive habitats and areas of deep peat with clarification on the size of the footprint required to accommodate a battery storage facility for 35 turbines with appropriate drainage.	As set out in SEPA's response, we would be happy for a condition requiring bunding and drainage. As shown on Figure 4.10, the battery storage facilities would be housed within single-storey control building which would be situated within the main substation compound. The proposed location of the main substation compound is shown on Figure 4.1. As stated at paragraph 3.6.8 of Chapter 3 of the EIA Report, the location of this compound has taken account of sensitive ecology areas, peat and hydrology.





Consultee	Summary of Comments	SWL Response
	We therefore object until an updated site plan is provided showing this infrastructure overlaid on the updated NVC and peat depth map.	 Figure 3.1 in Appendix 9H: PMP shows the location of site infrastructure, including the main substation, overlaid on peat depth data. Finally, it should be noted, that the substation buildings and battery storage facilities would be located in a borrow pit location, which would be previously disturbed ground. Figures 9B8.1a-f show the site infrastructure overlain on NVC data, which as stated in reference to 2.4, we consider remains current. The site infrastructure will also be overlain on the Peat Survey Depth Point Data figure which will be provided as part of the Al.
	8.1 We note the EIAR proposes micrositing allowances for turbines and crane pads up to 50m and 100m for internal wind farm tracks and other infrastructure. Micrositing to this degree has the capacity to compromise the mitigation requested. We object until the constraints and environmental impacts are investigated more thoroughly and a satisfactory layout agreed prior to determination. We would also request that micrositing be agreed only where it would result a) in less disturbance of peat and b) no loss of sensitive wetland habitat.	The possibility to micro-site infrastructure is requested in the EIA Report to ensure some flexibility is retained should it be determined that the locations of turbines or tracks require to be re- sited as a result of findings from various studies that are undertaken in advance of construction commencing. SWL would be happy for the requirement for micro-siting to be conditioned, with prior written approval of the Planning Authority in consultation with SNH and SEPA a requirement of the condition. Condition worded in such a way that can only microsite into less sensitive area.
	Section 10 SEPA seek that commitments and/ or amendments are made to the PMP in relation to track verges, cut batters, preservation and re-use of turves and commitment to consult. It is stated that SEPA would be happy for these requirements to be made the subject of a condition.	SWL note the amendments requested and will seek to address these within the updated PMP to be submitted as part of the AI.
	Section 11 SEPA has provided details of the regulatory requirements SWL will be required to comply with in relation to the construction of the proposed wind farm.	SWL notes the regulatory advice provided.
SNH 17/07/2019	Ornithology The qualifying interests of the Lewis Peatlands Special Protection Area (SPA) which are present on site will not be adversely affected by the proposal. The proposal could affect nationally important natural heritage interests and we object to this proposal until further information is provided. Specifically, there is insufficient information to determine whether the proposal is likely to adversely impact on the hen harrier population in the Outer Hebrides. In order for this to be	SWL acknowledges that only one year of ornithological survey work is presented in the EIA Report and can advise that a second year of surveys was completed in September 2019. This survey work will be provided to ECU and consultees as AI. See the response outlined in relation to the RSPB above for further details.
	determined, an assessment of the impact on hen harrier, based on two years of data from the development site should be provided.	





Consultee	Summary of Comments	SWL Response
	Landscape and visual impacts We are not able to comment on the landscape and visual impacts of this proposal.	SWL note this response.
	Ecology There is not likely to be a significant effect on the qualifying interests of the Lewis Peatlands Special Area of Conservation (SAC), nor on any other Natura 2000 site. An appropriate assessment is therefore not required.	SWL acknowledge that no objection has been made.
	We are content with the assessment of impacts on the European Protected Species otter, as low. We take it as read that mitigation measures embedded in the EIA will be implemented for this to be realised, and that an Otter Protection Plan will be produced.	
	There will be impacts on blanket bog and wet heath habitat due to loss of these to accommodate site infrastructure. These are significant at the site level, but less so regionally in view of the very considerable extent of the resource present on Lewis.	
Scotways 17/07/2019	We are concerned that the standoff distance of the closest turbine to the Hebridean Way is 142m. This distance neither complies with the guidance noted above nor the CNES Supplementary Guidance for Wind Energy Development. In light of the proximity of this turbine to a promoted route, which is also a public road, the Society objects to this application.	It is noted in the Planning Statement that the location of this turbine within topple distance of the public road/Hebridean Way is contrary to the CNES Supplementary Guidance for Wind Development. The relocation of the wind turbine further away from the public road has been considered; however this would impact on other environmental and technical considerations. As a result, it is not possible to move the turbine further from the Path
British Horse Society 21/07/2019	Should the developer take account of BHS they could open up superb opportunities for multi-use access. Walkers, cyclists and horse riders will all benefit from any public access tracks created, especially if the tracks are dressed in fine material. The BHS feels that the public access opportunities are huge in respect of this project.	SWL acknowledges that no objection has been made.
Met Office 14/08/2019	The turbines will be 15km from, in line of sight to, and will cause unacceptable interference to the Met Office radar at the Druim-a-Starraig weather radar. The turbines are within line of sight of the radar and are anticipated to cause significant shadowing, clutter and Doppler effects. It is estimated that a sector extending approximately 20 degrees in azimuth would be affected. The degradation of the radar capability and utility would be considerable and the Met Office objects to this application. A series of conditions are proposed seeking a	SWL have had detailed discussion with the Met office regarding the need for Radar Mitigation scheme for the Consented Development. Agreement has been reached regarding mitigation and work has commenced on the required solution; it is understood that this mitigation solution is also suitable for the proposed development. As such SWL accept the need for a Radar mitigation scheme; a planning condition should be attached to any consent requiring a Radar Mitigation Scheme as a pre- condition of the reaction of any turbines.
	Radar Mitigation Scheme as a pre-condition of the erection of any turbines.	



wood.

Consultee	Summary of Comments	SWL Response
	With this in place the Met Office consider their position is not controversial.	
Comhairle nan Eilean Siar (CnES)	CnES have not formally responded to date but have contacted the ECU seeking an extension to timescales. Interim responses have been made by the following departments:	
	Roads, Bridges and Streetlighting A traffic management plan should be submitted for approval showing the proposed movements of haulage and site traffic as stated in Volume 2 Chapter 13 of the EIA Report.	SWL would be happy for the requirement for a TMP to be conditioned and details agreed prior to the commencement of construction.
	Comhairle Archaeologist Consideration for the direct and indirect impacts on the heritage resource has been appropriately assessed. Mitigation of direct impacts will be managed through a programme of archaeological works agreed in advance with the Comhairle Archaeology Service for all areas of potential negative impact. Indirect impacts have been addressed through assessment of sensitivity to identified heritage assets by the proposed development and where necessary the projects plan was redesigned to reduce impact.	SWL acknowledges that no objection has been made.
	The Archaeology Service recommends that an Archaeological Clerk of Works is appointed to manage the program of works. This should include but not be restricted to, provision for monitoring, 10% evaluation, palaeo-environmental sampling and where necessary excavation; this will include any subsequent post excavation analysis and publication. The suggested mitigation will be sufficient to offset the potential impact of the development on	
	 Environmental Health My response is based on the caveat that the developer has included all the noise from all consented wind farms in the cumulative assessment. I also acknowledge that some assessments are predicted on the presumption that other developments (or parts thereof) will not be proceeding. The developments considered for cumulative noise assessment are: Beinn Ghrideag; in place; Arnish Moor; in place; Creed Enterprise Park; in place; Pentland Road; in place; Bridge Cottages, Newmarket; in place. 	The cumulative noise assessment presented in Chapter 12 of the EIA Report excludes the Sandwick East Street Wind Farm and North Street Community Turbines on the basis that they only intend to proceed if the Consented Stornoway Wind Farm does not. As the Proposed Development is a re-design of the Consented Development then, taking a pragmatic approach, it would not be possible to construct both. The owner of Druim Dubh remains financially involved in the Stornoway scheme and the higher lower-fixed noise limits of 45dB(A) has been applied for this location to the noise assessment for the development alone and cumulative assessments. SWL notes the conditions proposed (as included in Appendix C) and would be happy for these to be imposed should consent be granted.





Consultee	Summary of Comments	SWL Response
	• Sandwick East Street (Druim Speireag) has 10 turbines proposed which are on locations similar to turbines 5, 8, 4, 2, 12, 11, 10, 9 of the Stornoway Wind Farm;	
	 Knock and Swordale Community Company Ltd (Beinn Thulabaigh) has turbine which is on locations similar to turbine 25 of the Stornoway Wind Farm; 	
	 North Street Community Turbine (Beinn Bhuna?) which does not appear to be on a similar location to any on the Stornoway Wind Farm 2019 application. Should they include this? I understand it says in the North Street Community Turbine application that if SWF goes ahead this won't. 	
	This development is for 35 turbines and I am assuming that if this goes ahead Druim Speireag will not and Turbine 25 of the SWF will not.	
	The noise report states that the predicted cumulative levels are all below the cumulative limits and even though they have not included North Street Community Turbine in the cumulative assessment it is not thought to be close enough to noise sensitive premises to materially add to the cumulative level.	
	Of note is that the noise receptor at Druim Dubh, had a separate noise condition recommended as it was understood that Stornoway Wind Farm had a financial involvement in (level of 45dB). It would be assumed that if that development went ahead then the cumulative level at Druim Dubh would also be 45.	
	The attached proposed planning condition is based on the background noise assessment of SWF in 2011.	
	Landscape and Visual	SWL note the final comments from the Landscape
	 The full vertical extent of the proposed turbines is more visible in elevated views from part of the Eye Peninsula. 	Consultant, who identified that significant effects would arise from key viewpoints in Stornoway Town and from the War Memorial.
	 The use of multiple turbine heights is only partially successful: 180m turbines will even whether the scale of 	However, SWL understand that CnES recognise the proposed scheme would not have additional significant effects when compared to the
	buildings and other features on fringes of Stornoway and the 180m turbines on southern periphery would increase prominence in views from A859.	In terms of lighting, SWL note that CnES would welcome a reduction in the amount of turbine lighting if possible but recognised the requirements to have visible lighting on the turbines as required by HIAL.

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Consultee	Summary of Comments	SWL Response
	• The size and extensive spread of the wind farm means it will be a dominant feature that would deflect from the contrast that currently occurs in the size and pattern of existing turbine groups.	
	 As well as including the boggy moor of the wind farm site, the LCT also includes the coastal inlet of Stornoway (the town, Lews Castle and Lady Level Park GDL and the intricate harbour seascape. However: 	
	The LVIA has not defined the separate character of the Stornoway inlet within the LCT (as per GLVIA3 guidance) and therefore the characteristics of this area that would be important in considering the effects of the proposal have not been identified; and	
	Lews Castle and Lady Lever Park GDL aren't mentioned in describing the character of the LCT and therefore the value of the GDL has not been taken into account.	
	• SNH's comments on the consented scheme regarding the likely significant adverse L&V effects on the setting of Stornoway due to the size and large extent of turbines but it is noted that they did not provide comments on the L&V effects of the new proposal;	
	• There would be significant effects on the receiving landscape of the LCT but the landscape is less sensitive than the Stornoway inlet and the effects on its character are a key concern, particularly on the approach from the ferry and A866 where the large turbines would appear as dominant features on low wooded ridgelines which provide the backdrop to the town.	
	 There would be significant adverse effects on visual amenity, with the most severe being from: 	
	 The ferry approach – extensive spread on skyline & dominate views; 	
	 From A866 – prominent feature on long low ridgeline; significant adverse effects for road users & local residents; 	
	 Gallows Hill & Lewis War Memorial – dominant features to W & SW; layout poor in relation to existing turbines & infrastructure; 	
	From A859 & A857 – substantial array; dominating views; significant adverse effects on road users.	





Consultee	Summary of Comments	SWL Response
	 More limited views from historic core of Stornoway but in elevated parts of town (where properties are orientated W and SW) effects would be significant and adverse; 	
	• Agree with the judgements made on the likely significance of effects set out in the Night Time Assessment. Significant adverse effects would occur on Boggy Moor 1 LCT and from sections of the A859, the A857, the Ullapool-Stornoway ferry, from parts of the Eye peninsula and elevated residential areas around Stornoway, and from part of the golf course and Gallows Hill within the Lews Castle and Lady Lever Park GDL;	
	• Significant adverse cumulative effects would arise in close views, however in other views the proposal would be so large and extensive that it would be likely to deflect attention away from the smaller developments;	
	 ZTV maps and visualisations comparing the consented and proposed wind farm indicate that there would be very little new visibility associated with the larger turbines. There would be no material difference between the two scheme in the visual effects from key close views from Ullapool / Stornoway Ferry, Gallows Hill and Lewis War Memorial. In views from the A859 near Luirbost, there would be a slightly improved degree of containment in the proposed scheme and although the proposed turbines would be prominent, the existing character of this section of the route is generally less sensitive. 	
	 The installation of radar proximity activated lighting to minimize the duration of night time lighting effects; 	
	Redesign of layout & reducing height of some turbines to improve appearance of the wind farm in views from Lewis War Memorial but acknowledges that the effects on views would remain significant and adverse due to the proximity of the wind farm to this sensitive viewpoint.	
	Socio-Economics A previous consent for 42 wind turbines on the site around Stornoway is in place. However, there has been a material change in what is proposed – a reduction from 42 turbines to 35, higher output, units - and this is, therefore, a new application, supported by a new EIA.	SWL acknowledges that no objection is raised. No further action is required.

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Consultee	Summary of Comments	SWL Response
Consultee	 Summary of Comments This new application is for an installed capacity of 196.0MW compared to the 151.2MW of the previous consent. Given that the number of wind turbines has been reduced under this new application, construction impacts may be lower than previously forecast, certainly in terms of site preparation and civils. Many of the new turbines will be considerably larger than those proposed previously so the fabrication impacts may not differ considerably from earlier projections. Projections for operation impacts remain valid at 19 FTE Direct and 8 Direct. Community Benefit is not a material consideration in the planning process and the following comments are offered without prejudice to the planning assessment of this scheme. With regard to Community Benefit impacts, the developer has committed to an index linked contribution of \$4,000 per installed MW per year which equates to around £600,000 per annum based on the already consented 151.2MW. The new application increases that to a consented 196MW and will bring an additional £180,000 per annum in Community Benefit. This income to the community will be in addition to landord / crofter 	SWL Response
	community will be in addition to landlord / crofter rentals and a generous Shared Ownership offer being taken forward by The Stornoway Trust. It is considered that Community benefit payments will result in the creation of 8.1 FTE posts in the community.	
	It is worth noting that Scottish Hydro Electric (Transmission) Limited has made it a condition of Radial Connector construction that Stornoway Wind Farm is successful in its bid to the 2019 Contract for Difference Auction Round.	
Ironside Farrar 23/08/2019	The PLSRA requires minor revisions: although much of the PLSRA is sound, there are some key elements that are considered to be insufficiently robust to support the PLSRA conclusions and minor revisions are required.	An updated Peat Slide Risk Assessment addressing the points raised by Ironside Farrar will be provided as part of the Al.





Issued by



Approved by



Sue Birnie

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Appendix A BT Response

A1





Subject:

FW: Stornoway Wind Farm - Section 36 Consultation - Consultees

From: paul.3.atkinson@openreach.co.uk <paul.3.atkinson@openreach.co.uk> On Behalf Of
radionetworkprotection@bt.com
Sent: 25 June 2019 13:55
To: Doggett, Tim <<u>tim.doggett@woodplc.com></u>
Cc: radionetworkprotection@bt.com; paul.3.atkinson@openreach.co.uk
Subject: RE: Stornoway Wind Farm - Section 36 Consultation - Consultees

OUR REF: WID11013 & WID10989 T1-T35

Dear Mr Doggett,

Turbine 7 is 147.65m away from the 8 x radio links but from the rotor blade tip to radio links is only 79m.

Ideally BT prefer a 100mtr buffer zone for operational and contingency reasons, however on extreme occasions BT will only accept as an absolute

minimum requirement , a 25mtr buffer from the edge of the 2nd Fresnel zone to the blade tip of any turbine.

To air on caution, due to the long path length of almost 35km of the 8 x radio links, BT would be prepared to accept the location of Turbine 7 if there is

no alternative to re-locating due to environmental constraints and able to achieve our preferred clearance of 100m from the blade tip, but only with a

caveat, that there will be no micro siting of the turbine closer to our radio links regardless of ground conditions.

Kind Regards, Paul Atkinson Fibre and Network Delivery Radio Frequency Allocation & Network Protection (BNJ112) Openreach Tel: 0113 8074481 Mobile 07711111453 Web: www.openreach.co.uk PLEASE ALWAYS RESPOND TO radionetworkprotection@bt.com

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From: Doggett, Tim [mailto:tim.doggett@woodplc.com]
Sent: 20 June 2019 14:36
To: radionetworkprotection G
Cc: Birnie, Sue; Taggart, Catherine
Subject: RE: Stornoway Wind Farm - Section 36 Consultation - Consultees

Dear Sir/Madam

Thank you for your consultation response below regarding the BT point to point microwave links on the Stornoway site.

Whilst I understand BT's preference is for a clearance of 100m+blade tip from the link, unfortunately this has not been possible to achieve on this site due to other constraints.

In previous correspondence with BT on other wind farm sites, I have however been advised that it is possible that "*BT* will only accept as a minimum requirement, a 25mtr buffer from the edge of the 2nd Fresnel zone to the blade tip of any turbine".

I have calculated the 2nd Fresnel zone as being 29.54m, using the information provided below. This plus the 25m buffer gives a total of 54.54m. Adding the blade length of 68m gives a minimum clearance distance of 122.54m from the blade tip, based on the above quoted requirement.

As turbine 7 is 147.65m away from the link would BT be prepared to accept the location of turbine 7 as it currently stands in conjunction with a planning condition not to move the turbine any more than 10m closer to the link during any micrositing activities, should they be required for reasons of ground conditions etc?

Many thanks

Tim

Tim Doggett Senior Consultant Direct: +44 (0)131 448 1172 www.woodplc.com



From: paul.3.atkinson@openreach.co.uk <paul.3.atkinson@openreach.co.uk > On Behalf Of radionetworkprotection@bt.com Sent: 29 May 2019 17:17 To: Christopher.Park@gov.scot; Econsents Admin@gov.scot Cc: radionetworkprotection@bt.com Subject: RE: Stornoway Wind Farm - Section 36 Consultation - Consultees

OUR REF: WID10989 T1-T35

Thank you for your email dated 28/05/2019 regarding this windfarm proposal.

We have studied the windfarm proposal with respect to EMC and related problems to BT point-topoint microwave radio links.

The conclusion is that **TURBINE 7** proposed may cause interference to BT's current and presently planned radio network. See below a Network Map (the blue lines indicate 10km grids) of the proposed turbine 7 in relation to our fixed radio links and the 8 x BT radio network links that may be potentially affected.

Also, I have attached the Wind Turbine Coordinator Analysis Results which shows each of the 8 x links affected, with all the information that you require ; Transmit and Receive Station Name/Address and associated NGR, Link Number, Path Length, Frequency band. It shows that turbine 7 is 147.65mtrs from our 8 x fixed radio links, less 68mtrs radius of the rotor blade only leaves 79mtrs from the blade tip to the fixed radio links. BT ideally prefer a buffer of 100mtrs from blade tip to fixed radio link, this distance is set for a reason.

Our position is therefore, we would object to future development of this Windfarm, if it strongly interfered with the existing BT radio links.

BT require ideally 100m minimum clearance from the Blade tip to the link path.

F T WID10989 T7 26783		-	
	Tx Name	Tx NGR	Rx Name
	1	I	1
		-	
	MAARUIG GORMUL BT RS	NB1865006975	STORNOWAY BT RS
	MAARUIG GORMUL BT RS	NB1865006975	STORNOWAY BT RS
	MAARUIG GORMUL BT RS	NB1865006975	STORNOWAY BT RS
	MAARUIG GORMUL BT RS	NB1865006975	STORNOWAY BT RS
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	MAARUIG GORMUL BT RS	NB1865006975	STORNOWAY BT RS

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4.2.15 The layout of the Proposed Development incorporating maximum tip ł the turbines) has been chosen because it balances sustainably high prc environmental sensitivities present at the Development Site. Each chap topic specific approach to assessment of the Proposed Development w that are set out in **Table 4.1**.

Turbine ID	Easting	Northing	Max Tip Height
1	134518	931471	180m
2	135057	931501	180m
3	135334	930964	180m
4	135974	931083	180m
5	136504	931093	180m

Table 4.1 Application Turbine Parameters

April 2019 Doc Ref:..40001CGoS031

Turbine ID	Easting	Northing	Max Tip Height
6	137085	931096	180m
7	137745	931334	156m
8	137459	931647	180m
9	137054	931906	180m
10	136256	931758	180m
11	135678	931644	180m
12	135509	932128	180m
13	136047	932198	180m
14	136837	932330	180m
15	137962	932171	156m
16	138185	932705	156m
17	137539	932809	180m
18	137197	932997	180m
19	138130	933104	156m
20	138511	933652	156m
21	138265	934003	156m
22	137306	934087	180m
23	137124	934521	180m
24	136467	934645	180m
25	136497	935172	180m

26	137065	935045	180m
27	137656	935217	180m
28	137716	934787	180m
29	138091	934590	156m
30	138558	934796	156m
31	138323	935192	180m
32	138066	935798	180m
33	138600	935760	156m
34	138915	935506	156m
35	137800	934040	180m



Kind Regards, Paul Atkinson Fibre and Network Delivery Radio Frequency Allocation & Network Protection (BNJ112) Openreach Tel: 0113 8074481 Mobile 07711111453 Web: www.openreach.co.uk

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From: <u>Christopher.Park@gov.scot</u> [<u>mailto:Christopher.Park@gov.scot</u>] **Sent:** 28 May 2019 11:19 **Subject:** Stornoway Wind Farm - Section 36 Consultation - Consultees

Dear Sir or Madam

THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017 ELECTRICITY ACT 1989 SECTION 36 AND SCHEDULE 8: APPLICATION FOR THE PROPOSED STORNOWAY WIND FARM, 1.5KM SOUTH WEST OF THE TOWN OF STORNOWAY ON THE ISLE OF LEWIS WITHIN THE PLANNING AUTHORITY AREA OF COMHAIRLE NAN EILEAN SIAR

On 22 May 2019, Stornoway Wind Farm Limited submitted an application under section 36 of the Electricity Act 1989 ('the Act') for the Scottish Ministers' consent to construct and operate the proposed Stornoway Wind Farm approximately 1.5 kilometres (km) south west of the town of Stornoway on the Isle of Lewis, with the Comhairle nan Eilean Siar Planning Authority Area.

In accordance with the Electricity (Applications for Consent) Regulations 1990, the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA regulations') and regulations made under Schedule 8 (1) to the Electricity Act 1989, details of the application will be published in the local & national press, in the Edinburgh Gazette, and on the application website <u>www.lwp.scot</u>

The advert will appear in the following publications -

- Edinburgh Gazette on 30 May 2019
- Herald on 30 May 2019
- West Highland Free Press on 30 May & 6 June 2019
- Stornoway Gazette on 30 May & 6 June 2019

In accordance with Regulation 16 of the Electricity Works (Environmental Impact Assessment)(Scotland)Regulations 2017 a consultation in respect of the application must be carried out. The applicant will have sent you the application documentation in the format/s agreed previously.

The application documentation can be viewed at the Energy Consents website <u>www.energyconsents.scot</u> by:

- clicking on **Search** tab; then,
- clicking on Simple Search tab; then,
- typing Stornoway Wind Farm into Search by Project Name box then clicking on Go; then
- clicking on ECU00001850 and then click on Documents tab.

The closing date for any representations you may wish to make in this case is **27 June 2019.**

Please note reminder letters are no longer issued by the Energy Consents Unit for any project. If we have not received your comments, nor have we received any extension request by **27 June 2019** we will assume you have no comments to make.

Please e-mail your response to Econsents admin@gov.scot and christopher.park@gov.scot

If you have not received the documentation, please contact me as soon as possible.

Kind regards

Chris Park | Energy Consents | Directorate for Energy and Climate Change

Scottish Government | 4th Floor | 5 Atlantic Quay | 150 Broomielaw | Glasgow | G2 8LU Scottish Government | 4th Floor | 5 Atlantic Quay | 150 Broomielaw | Glasgow | G2 8LU Scottish Government | 4th Floor | 5 Atlantic Quay | 150 Broomielaw | Glasgow | G2 8LU Scottish Government | 4th Floor | 5 Atlantic Quay | 150 Broomielaw | Glasgow | G2 8LU

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Tha am post-d seo (agus faidhle neo ceanglan còmhla ris) dhan neach neo luchd-ainmichte a-mhàin. Chan eil e ceadaichte a chleachdadh ann an dòigh sam bith, a' toirt a-steach còraichean, foillseachadh neo sgaoileadh, gun chead. Ma 's e is gun d'fhuair sibh seo gun fhiosd', bu choir cur às dhan phost-d agus lethbhreac sam bith air an t-siostam agaibh agus fios a leigeil chun neach a sgaoil am post-d gun dàil.

Dh'fhaodadh gum bi teachdaireachd sam bith bho Riaghaltas na h-Alba air a chlàradh neo air a sgrùdadh airson dearbhadh gu bheil an siostam ag obair gu h-èifeachdach neo airson adhbhar laghail eile. Dh'fhaodadh nach eil beachdan anns a' phost-d seo co-ionann ri beachdan Riaghaltas na h-Alba.

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Appendix B Farrpoint Consultation Response



wood.

From:	Alan Patterson <alan.patterson@farrpoint.com></alan.patterson@farrpoint.com>
Sent:	14 February 2019 10:14
То:	Doggett, Tim
Cc:	Neil Watt
Subject:	RE: Stornoway Wind Farm Consultation Request

Hi Tim,

Yes it is only T20 that is of concern. I have re-checked all of the proposed locations against all our links now.

If we could reduce the Micrositing from 50m to 20m for this particular turbine, we could accept that new location.

Regards,

Alan

Alan Patterson

T. 01312026018 M. 07775763183



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From: Doggett, Tim <tim.doggett@woodplc.com>
Sent: 12 February 2019 22:13
To: Alan Patterson <alan.patterson@farrpoint.com>
Subject: RE: Stornoway Wind Farm Consultation Request

Hi Alan

Thanks for sending me through all the info back in June.

We have had some design iterations since then and I was hoping you could take a look at the final layout – I only really have any sort of concern with one turbine (T20).

I have attached an excel file containing the coordinates, the turbine in question will be 156m to tip and have a rotor diameter of 136m (or \sim 68m). The turbine is approximately 140m from the centre of the link. The

Based on my rough calcs I think the 2nd Fresnel zone is 11m, which would give a required stand off (as per the below) of 104m, which should be more than sufficient to avoid any interference. I believe that the standard Micrositing of 50m will be applied for, however we can limit movement in the direction of the link if required.

Many thanks

Tim

Tim Doggett Senior Consultant Direct: +44 (0)131 448 1172 www.woodplc.com



From: Alan Patterson <<u>alan.patterson@farrpoint.com</u>>
Sent: 11 June 2018 14:00
To: Doggett, Tim <<u>tim.doggett@woodplc.com</u>>
Subject: RE: Stornoway Wind Farm Consultation Request

Hi Tim,

Link co-ordinates below:

	Benadrove	140099	934513	Eitshal	130500	930200
--	-----------	--------	--------	---------	--------	--------

We use the radius of the F2 Fresnel zone of the link (13GHz) at the 90 degrees intersection point with the turbine, plus the turbine blade radius, plus a 25m margin and any micro-siting margin.

Regards,

Alan

Alan Patterson

T. 01312026018 M. 07775763183 Exchange Place 2, 5 Semple Street, Edinburgh, EH3 8BL 1st Floor, 99 Bishopsgate, London, EC2M 3XD





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From: Doggett, Tim <<u>tim.doggett@woodplc.com</u>> Sent: 11 June 2018 11:54 To: Alan Patterson <<u>alan.patterson@farrpoint.com</u>> Subject: RE: Stornoway Wind Farm Consultation Request

Hi Alan

Thank you for getting back to me.

As I mentioned in my email we are still in the early stages of the design and so turbines are likely to move around quite a bit. I was wondering if it would be possible to get the start and end coordinates of the link that runs across the site so I can plot it in GIS and therefore make sure we avoid the link in future designs iterations?

Also do you have a minimum separation distance you require as a buffer from the link centrepoint?

Many thanks

Tim

Tim Doggett Senior Consultant Direct: +44 (0)131 448 1172 www.woodplc.com



From: Alan Patterson [mailto:alan.patterson@farrpoint.com]
Sent: 11 June 2018 11:50
To: tim.doggett@woodplc.com
Cc: Neil Watt <<u>neil.watt@farrpoint.com</u>>
Subject: re: Stornoway Wind Farm Consultation Request

Hello Tim,

I have been passed the query you sent below to HIE. Farrpoint is the managing agent for the Connected Communities network and we act on behalf of HIE in regard to the Western Isles network.

I have carried out some analysis on the locations you provided and one turbine in particular (turbine number 28, grid ref 137755,933425) will cause an obstruction to one of our core microwave links and so we object to the proposed location of this turbine..

In order to adequately clear this link, we request this turbine be moved at least 85 metres towards the South. See the screenshot below.

Turbines 12 and 23 are also in close proximity, however, provided the locations you have given are accurate and not subject to change, we have no objection to those.



Regards,

Alan Patterson

T. 01312026018 M. 07775763183 Exchange Place 2, 5 Semple Street, Edinburgh, EH3 8BL 1st Floor, 99 Bishopsgate, London, EC2M 3XD





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From: Doggett, Tim [mailto:tim.doggett@woodplc.com]
Sent: 30 May 2018 10:43
To: Donnie Morrison <<u>donnie.morrison@hient.co.uk</u>>
Subject: Stornoway Wind Farm Consultation Request

Dear Sir/Madam

Wood are currently investigating the feasibility of a redesigned wind farm near Stornoway on the Isle of Lewis. The site has a consented wind farm on it (consented 2012 and variation consented 2016) and we are examining the feasibility of a further redesign to accommodate the most recent advances in turbine technology and power.

The site has a centre point of E 137570, N 933340, and extends 4km from this location. The indicative turbine locations are as follows, and each will have a height to blade tip of 187m with a rotor diameter of 164m, although this is subject to change during the design and consultation process.

Turbine Coordinates:

32 138030 934949 33 138138 934310

I am looking to establish the presence or otherwise of any microwave links in the region.

A hasty response would be appreciated and if convenient I would gladly accept emailed responses. If you have any questions or require further information please do not hesitate to contact me. If I don't receive a response within 30 days I will assume that no infrastructure owned by your organisation will be affected by the development.

Kind regards,

Tim

Tim Doggett Senior Consultant Direct: +44 (0)131 448 1172 www.woodplc.com

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Appendix C 10 SWF 2019 Noise Conditions June 2019 Based on IOA Template





The rating level of noise emissions from the combined effects of the wind turbines forming part of the Development (including the application of any tonal penalty) shall not exceed the values for the relevant integer wind speed set out in, or derived from, the tables attached to this condition at any dwelling which is lawfully existing or has planning permission at the date of this consent. The turbines shall be designed to permit individually controlled operation or shut down at specified wind speeds and directions in order to facilitate compliance with noise criteria and:

- a) The wind farm operator shall continuously log power production, wind speed and wind direction, all in accordance with Guidance Note 1(d). These data shall be retained for a period of not less than 24 months. The wind farm operator shall provide this information in the format set out in Guidance Note 1(e) to the Local Planning Authority on its request, within 14 days of receipt in writing of such a request.
- b) No electricity shall be exported until the wind farm operator has submitted to the Local Planning Authority for written approval a list of proposed independent consultants who may undertake compliance measurements in accordance with this condition. Amendments to the list of approved consultants shall be made only with the prior written approval of the Local Planning Authority.
- c) Within 21 days from receipt of a written request from the Local Planning Authority following a complaint to it from an occupant of a nearby dwelling alleging noise disturbance at that dwelling, the wind farm operator shall, at its expense, employ a consultant approved by the Local Planning Authority to assess the level of noise immissions from the wind farm at the complainant's property in accordance with the procedures described in the attached Guidance Notes. The written request from the Local Planning Authority shall set out at least the date, time and location that the complaint relates to and any identified atmospheric conditions, including wind direction, and include a statement as to whether, in the opinion of the Local Planning Authority, the noise giving rise to the complaint contains or is likely to contain a tonal component.
- d) The assessment of the rating level of noise immissions shall be undertaken in accordance with an assessment protocol that shall previously have been submitted to and approved in writing by the Local Planning Authority. The protocol shall include the proposed measurement location identified in accordance with the Guidance Notes where measurements for compliance checking purposes shall be undertaken, whether noise giving rise to the complaint contains or is likely to contain a tonal component, and also the range of meteorological and operational conditions (which shall include the range of wind speeds, wind directions, power generation and times of day) to determine the assessment of rating level of noise immissions. The proposed range of conditions shall be those which prevailed during times when the complainant alleges there was disturbance due to noise, having regard to the written request of the Local Planning Authority under paragraph (c), and such others as the independent consultant considers likely to result in a breach of the noise limits.
- e) Where a dwelling to which a complaint is related is not listed in the tables attached to these conditions, the wind farm operator shall submit to the Local Planning Authority for written approval proposed noise limits selected from those listed in the Tables to be adopted at the complainant's dwelling for compliance checking purposes. The proposed noise limits are to be those limits selected from the Tables specified for a listed location which the independent consultant considers as being likely to experience the most similar background noise environment to that experienced at the complainant's dwelling. The rating level of noise immissions resulting from the combined effects of the wind turbines when determined in accordance with the attached Guidance Notes shall not exceed the noise limits approved in writing by the Local Planning Authority for the complainant's dwelling.
- f) The wind farm operator shall provide to the Local Planning Authority the independent consultant's assessment of the rating level of noise immissions undertaken in accordance with the Guidance Notes within 2 months of the date of the written request of the Local Planning Authority for compliance measurements to be made under paragraph (c), unless the time limit is extended in writing by the Local Planning Authority. The assessment shall include all data collected for the purposes of undertaking the compliance measurements, such data to be provided in the format set out in Guidance Note 1(e) of the Guidance Notes. The instrumentation used to undertake the measurements shall be calibrated in accordance with Guidance Note 1(a) and certificates of calibration shall be submitted to the Local Planning Authority with the independent consultant's assessment of the rating level of noise immissions.
- g) Where a further assessment of the rating level of noise immissions from the wind farm is required pursuant to Guidance Note 4(c), the wind farm operator shall submit a copy of the further assessment within 21 days of submission of the independent consultant's assessment pursuant to paragraph (d) above unless the time limit has been extended in writing by the Local Planning Authority.

Table 1 – Between 07:00 and 23:00 – Noise limits expressed in dB LA90,10 minute as a function of the standardised wind speed (m/s) at 10 metre height as determined within the site averaged over 10 minute periods

Location	Standardised wind speed at 10 meter height (m/s) within the site averaged over 10-minute periods									
	3	4	5	6	7	8	9	10	11	12
1:Gleann Ur North	36.5	37.8	38.7	39.8	41.1	42.6	44.3	46.2	48.3	50.7
2:Cnoc Uilleam Chubair	36.5	37.8	38.7	39.8	41.1	42.6	44.3	46.2	48.3	50.7
3:Gleann Ur	36.5	37.8	38.7	39.8	41.1	42.6	44.3	46.2	48.3	50.7
4:Bennadrove Road	35	35	35.3	36.5	37.8	39.1	40.4	41.8	43.3	44.8
5:Cnoc Mairi	35	35	35.3	36.5	37.8	39.1	40.4	41.8	43.3	44.8
6:Creed Bridge	38	38.4	39.2	40	41.1	42.3	43.6	45	46.7	48.4
7:Druim Dubh	45	45	45	45	45	45	45	47.2	49.7	52.1
8:Macaulay Farm	39.4	39.4	39.7	40.2	40.9	41.9	43.2	44.6	46.3	48.3

*Figures as per background noise assessment in S.9 of SWF EIA report 2011 taking into account 35dB LA90, 10min or the Day-time Hours LA90, 10min Background Noise Level plus 5bB(A), whichever is the greater;

Table 2 – Between 23:00 and 07:00 – Noise limits expressed in dB L_{A90} ,10-minute as a function of the standardised wind speed (m/s) at 10 metre height as determined within the site averaged over 10 minute periods.

Location	Standardised wind speed at 10 meter height (m/s) within the site averaged over 10-minute periods									
	3	4	5	6	7	8	9	10	11	12
1:Gleann Ur North	38	38	38	38	38	38	38	39.4	41.7	44.5
2:Cnoc Uilleam Chubair	38	38	38	38	38	38	38	39.4	41.7	44.5
3:Gleann Ur	38	38	38	38	38	38	38	39.4	41.7	44.5
4:Bennadrove Road	38	38	38	38	38	38	38	38	38.1	40.3
5:Cnoc Mairi	38	38	38	38	38	38	38	38	38.1	40.3
6:Creed Bridge	38	38	38	38	38	38	38.3	39.9	41.7	43.6
7:Druim Dubh	45	45	45	45	45	45	45	45	45	46.8
8:Macaulay Farm	38	38	38	38	38	38	38.5	40 1	41.8	437

*Figures as per background noise assessment in S.9 of SWF EIA report 2011 taking into account 38dB LA90, 10min or the night Hours LA90, 10min Background Noise Level plus 5bB(A), whichever is the greater;

Table 3: Coordinate locations of the properties listed in Tables 1 and 2.

Property	Grid Reference	Easting	Northing		
1:Gleann Ur North	NB 40930 34980	140930	934980		
2:Cnoc Uilleam Chubair	NB 41070 35580	141070	935580		
3:Gleann Ur	NB 40750 34530	140750	934530		
4:Bennadrove Road	NB 40560 34280	140560	934280		
5:Cnoc Mairi	NB 40440 33960	140440	933960		
6:Creed Bridge	NB 40417 32666	140417	932666		
7:Druim Dubh	NB 38330 30520	138330	930520		
8:Macaulay Farm	NB 40120 32150	140120	932150		

Note to Table 3: The <u>geographical coordinate references</u> are provided for the purpose of identifying the general location of dwellings to which a given set of noise limits applies.

GUIDANCE NOTES FOR NOISE CONDITIONS

These notes are to be read with and form part of the noise condition. They further explain the condition and specify the methods to be employed in the assessment of complaints about noise immissions from the wind farm. The rating level at each integer wind speed is the arithmetic sum of the wind farm noise level as determined from the best-fit curve described in Guidance Note 2 of these Guidance Notes and any tonal penalty applied in accordance with Guidance Note 3. Reference to ETSU-R-97 refers to the publication entitled "The Assessment and Rating of Noise from Wind Farms" (1997) published by the Energy Technology Support Unit (ETSU) for the Department of Trade and Industry (DTI).

GUIDANCE NOTE 1

- a) Values of the L_{A90,10 minute} noise statistic should be measured at the complainant's property, using a sound level meter of EN 60651/BS EN 60804 Type 1, or BS EN 61672 Class 1 quality (or the equivalent UK adopted standard in force at the time of the measurements) set to measure using the fast time weighted response as specified in BS EN 60651/BS EN 60804 or BS EN 61672-1 (or the equivalent UK adopted standard in force at the time of the measurements). This should be calibrated in accordance with the procedure specified in BS 4142: 1997 (or the equivalent UK adopted standard in force at the time of the measurements). Measurements shall be undertaken in such a manner to enable a tonal penalty to be applied in accordance with Guidance Note 3.
- b) The microphone should be mounted at 1.2 1.5 metres above ground level, fitted with a two-layer windshield or suitable equivalent approved in writing by the Local Planning Authority, and placed outside the complainant's dwelling. Measurements should be made in "free field" conditions. To achieve this, the microphone should be placed at least 3.5 metres away from the building facade or any reflecting surface except the ground at the approved measurement location. In the event that the consent of the complainant for access to his or her property to undertake compliance measurements is withheld, the wind farm operator shall submit for the written approval of the Local Planning Authority details of the proposed alternative representative measurement location prior to the commencement of measurements and the measurements shall be undertaken at the approved alternative representative measurement location.
- c) The L_{A90,10 minute} measurements should be synchronised with measurements of the 10-minute arithmetic mean wind and operational data logged in accordance with Guidance Note 1(d), including the power generation data from the turbine control systems of the wind farm.
- d) To enable compliance with the conditions to be evaluated, the wind farm operator shall continuously log arithmetic mean wind speed in metres per second and wind direction in degrees from north at hub height for each turbine and arithmetic mean power generated by each turbine, all in successive 10-minute periods. Unless an alternative procedure is previously agreed in writing with the Planning Authority, this hub height wind speed, averaged across all operating wind turbines, shall be used as the basis for the analysis. All 10 minute arithmetic average mean wind speed data measured at hub height shall be 'standardised' to a reference height of 10 metres as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05 metres. It is this standardised 10 metre height wind speed data, which is correlated with the noise measurements determined as valid in accordance with Guidance Note 2, such correlation to be undertaken in the manner described in Guidance Note 2. All 10-minute periods shall commence on the hour and in 10-minute increments thereafter.
- e) Data provided to the Local Planning Authority in accordance with the noise condition shall be provided in comma separated values in electronic format.
- f) A data logging rain gauge shall be installed in the course of the assessment of the levels of noise immissions. The gauge shall record over successive 10-minute periods synchronised with the periods of data recorded in accordance with Note 1(d).

GUIDANCE NOTE 2

- a) The noise measurements shall be made so as to provide not less than 20 valid data points as defined in Guidance Note 2 (b)
- b) Valid data points are those measured in the conditions specified in the agreed written protocol under paragraph (d) of the noise condition, but excluding any periods of rainfall measured in the vicinity of the sound level meter. Rainfall shall be assessed by use of a rain gauge that shall log the occurrence of rainfall in each 10 minute period concurrent with the measurement periods set out in Guidance Note 1. In specifying such conditions the Local Planning Authority shall have regard to those conditions which prevailed during times when the complainant alleges there was disturbance due to noise or which are considered likely to result in a breach of the limits.
- c) For those data points considered valid in accordance with Guidance Note 2(b), values of the L_{A90,10} minute noise measurements and corresponding values of the 10- minute wind speed, as derived from the standardised ten metre height wind speed averaged across all operating wind turbines using the procedure specified in Guidance Note 1(d), shall be plotted on an XY chart with noise level on the Y-axis and the standardised mean wind speed on the X-axis. A least squares, "best fit" curve of an order deemed appropriate by the independent consultant (but which may not be higher than a fourth order) should be fitted to the data points and define the wind farm noise level at each integer speed.

GUIDANCE NOTE 3

- a) Where, in accordance with the approved assessment protocol under paragraph (d) of the noise condition, noise immissions at the location or locations where compliance measurements are being undertaken contain or are likely to contain a tonal component, a tonal penalty is to be calculated and applied using the following rating procedure.
- b) For each 10 minute interval for which L_{A90,10 minute} data have been determined as valid in accordance with Guidance Note 2 a tonal assessment shall be performed on noise immissions during 2 minutes of each 10 minute period. The 2 minute periods should be spaced at 10 minute intervals provided that uninterrupted uncorrupted data are available ("the standard procedure"). Where uncorrupted data are not available, the first available uninterrupted clean 2 minute period out of the affected overall 10 minute period shall be selected. Any such deviations from the standard procedure, as described in Section 2.1 on pages 104-109 of ETSU-R-97, shall be reported.
- c) For each of the 2 minute samples the tone level above or below audibility shall be calculated by comparison with the audibility criterion given in Section 2.1 on pages 104109 of ETSU-R-97.
- d) The tone level above audibility shall be plotted against wind speed for each of the 2 minute samples. Samples for which the tones were below the audibility criterion or no tone was identified, a value of zero audibility shall be used.
- e) A least squares "best fit" linear regression line shall then be performed to establish the average tone level above audibility for each integer wind speed derived from the value of the "best fit" line at each integer wind speed. If there is no apparent trend with wind speed then a simple arithmetic mean shall be used. This process shall be repeated for each integer wind speed for which there is an assessment of overall levels in Guidance Note 2.
- f) The tonal penalty is derived from the margin above audibility of the tone according to the figure below.



GUIDANCE NOTE 4

- a) If a tonal penalty is to be applied in accordance with Guidance Note 3 the rating level of the turbine noise at each wind speed is the arithmetic sum of the measured noise level as determined from the best fit curve described in Guidance Note 2 and the penalty for tonal noise as derived in accordance with Guidance Note 3 at each integer wind speed within the range specified by the Local Planning Authority in its written protocol under paragraph (d) of the noise condition.
- b) If no tonal penalty is to be applied then the rating level of the turbine noise at each wind speed is equal to the measured noise level as determined from the best fit curve described in Guidance Note 2.
- c) In the event that the rating level is above the limit(s) set out in the Tables attached to the noise conditions or the noise limits for a complainant's dwelling approved in accordance with paragraph (e) of the noise condition, the independent consultant shall undertake a further assessment of the rating level to correct for background noise so that the rating level relates to wind turbine noise immission only.
- d) The wind farm operator shall ensure that all the wind turbines in the development are turned off for such period as the independent consultant requires to undertake the further assessment. The further assessment shall be undertaken in accordance with the following steps:
- e) Repeating the steps in Guidance Note 2, with the wind farm switched off, and determining the background noise (L3) at each integer wind speed within the range requested by the Local Planning Authority in its written request under paragraph (c) and the approved protocol under paragraph (d) of the noise condition.
- f) The wind farm noise (L1) at this speed shall then be calculated as follows where L2 is the measured level with turbines running but without the addition of any tonal penalty:
- g) The rating level shall be re-calculated by adding arithmetically the tonal penalty (if any is applied in accordance with Note 3) to the derived wind farm noise L1 at that integer wind speed.
- h) If the rating level after adjustment for background noise contribution and adjustment for tonal penalty (if required in accordance with note 3 above) at any integer wind speed lies at or below the values set out in the Tables attached to the conditions or at or below the noise limits approved by the Local Planning Authority for a complainant's dwelling in accordance with paragraph (e) of the noise condition then no further action is necessary. If the rating level at any integer wind speed exceeds the values set out in the Tables attached to the conditions or the noise limits approved by the Local Planning Authority for a complainant's dwelling in accordance with paragraph (e) of the noise condition then no further action is necessary. If the rating level at any integer wind speed exceeds the values set out in the Tables attached to the conditions or the noise limits approved by the Local Planning Authority for a complainant's dwelling in accordance with paragraph (e) of the noise condition then the development fails to comply with the conditions.