



# Scottish Natural Heritage Dualchas Nàdair na h-Alba

All of nature for all of Scotland  
Nàdair air fad airson Alba air fad

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Our ref: CNS/REN/WF/55044/1431

24 July 2009

Dear Ms Deeney

## **PROPOSED VIKING WIND FARM, SHETLAND THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2000**

Thank you for your letter of 22 May 2009 and for granting Scottish Natural Heritage (SNH) an extension to allow time to consider and comment on the Environmental Statement for the proposed Viking wind farm in Shetland.

### **1. BACKGROUND**

1.1 The Viking Energy Partnership have submitted an application and Environmental Statement (ES) for a wind farm on mainland Shetland comprising:

- 150 wind turbines, each approximately 145mtrs in height (ground to blade tip)
- approximately 118km of associated access tracks of varying widths up to 12 mtrs
- approximately 14 borrow pits
- 8 temporary construction compounds
- 3 electrical substations
- 11 permanent lattice tower meteorological masts up to 90mtrs in height
- up to 300 temporary guyed meteorological masts
- buried cabling between the turbines and substations
- pole mounted transmission line from the substations to the main convertor station (the convertor station is subject of a separate planning application and EIA that SNH are a consultee for)
- there will also be some widening/alterations to the local road network
- construction is expected to be phased over a 5 year period, working mainly in the summer months to avoid bad weather and low light levels

1.2 The development area stretches from near Scatsta Airfield in the north of mainland Shetland to near Tresta in the south. The development area has been split into 4 sectors by the applicant for ease of reference; Delting (north western sector, 33 turbines), Collafirth (north eastern sector, 8 turbines), Kergord (south western sector, 47 turbines) and Nesting (south eastern sector, 62 turbines).

1.3 The proposed development area is near several sites designated for their natural heritage value. These are further described in section 4, Annex I and Annex II of this letter.



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- 1.4 SNH provided interim advice on the landscape and visual impact assessment (LVIA) in our correspondence of 3 July 2009, in which we advised that the LVIA section of the ES is inadequate. We therefore requested a revised LVIA to clarify several points. As agreed, **we will provide our full advice on the landscape and visual impacts of the proposal following receipt of the revised LVIA addendum and formal consultation from the Scottish Government.**
- 1.5 This response letter therefore provides our advice on ecological natural heritage issues only.

## 2. SNH POSITION

- 2.1 In respect of the **Sandwater Site of Special Scientific Interest (SSSI)**, **SNH objects subject to conditions of planning which would overcome our objection.** Further detail can be found in section 5 of this letter.
- 2.2 In respect of the European **Protected Species of otter**, **SNH does not object but provides advice.** Further detail can be found in section 6 of this letter.
- 2.3 In respect of **ornithological interests**, **SNH objects due to the magnitude of the predicted impacts on red-throated diver, merlin, golden plover, dunlin, whimbrel, arctic skua, lapwing, curlew and great skua. From the collision risk and displacement information presented in the ES, SNH consider that the favourable conservation status of these species is likely to be adversely affected over the long term at a regional scale, with red-throated diver and whimbrel also likely to be adversely affected at a national scale.** Further detail can be found in section 7 of this letter.
- 2.4 In respect of impacts on **peat, habitats, soil and water**, **SNH does not object but recommends several conditions of planning to further minimise the potential impacts of the proposal.** Further detail can be found in section 8 of this letter.

## 3. GENERAL COMMENTS ON THE ENVIRONMENTAL STATEMENT

- 3.1 Overall, SNH found the natural heritage sections of the ES generally well laid out and well written. Much of the ecological survey work appears to have been carried out to a level which has enabled us to assess the impacts of the proposed development on the natural heritage.
- 3.2 However, there were inconsistencies in the material submitted, and a lack of depth in the arguments and judgements used to reach decisions about the levels of significance for predicted impacts. In addition, it was impossible to verify many of the numerical figures stated in the ES, due to the inconsistencies and because the background calculations were not provided for reference. These factors caused us some difficulties in making our assessment, but did not prevent us from reaching informed conclusions on the impacts of the proposed development.
- 3.3 Where such inconsistencies, figures or points that would benefit from clarification/ verification have been noted, they are outlined in the relevant sections of this letter.

## 4. DESIGNATED SITES

- 4.1 Elements of the proposed development are in proximity to and likely to have an adverse effect on Sandwater Site of Special Scientific Interest (SSSI), approximately 1km to the east of Kergord. Sandwater SSSI is designated for the notified features of mesotrophic loch (a loch of medium nutrient levels) and open water transition fen (water margin habitat). An appraisal of the effects on this site is given in section 5.



- 4.2 We do not consider that any other sites designated for nature conservation within 10km of the proposed development areas will be affected by the proposed development as described in the ES. A summary of the sites considered by us when reaching this conclusion is provided in Annex I for information.
- 4.3 As requested in your letter of 22 May, Annex II outlines why we consider neither of the Special Areas of Conservation (SACs) that are within 2km of the proposed development areas are likely to be affected, and therefore why an Appropriate Assessment is not required.
- 4.4 Notwithstanding the above, should the development change significantly from that described in the ES, our advice is that the applicant should re-consider if the changes would affect any of the designated sites listed in Annex I. Should that be the case, the applicant may need to undertake further ecological assessments and consultations as appropriate.

## 5. APPRAISAL OF IMPACTS ON SANDWATER SSSI

- 5.1 Although not directly affected by the wind farm itself or associated infrastructure within the development boundary, Sandwater SSSI is likely to be adversely affected by other associated works outwith the development boundary:
- the A970/B9075 junction, noted in the ES as requiring to be altered to accommodate construction traffic. The existing junction is approximately 300mtrs from the boundary of the SSSI.
  - the B9075 will require to be upgraded in parts to accommodate construction traffic, including the installation of a new bridge/strengthening of an existing bridge, and a number of culverts for crossing minor watercourses (Vol.4a Part 3, 5.3.4). At the closest point, the existing B9075 is within 10mtrs of the boundary of the SSSI, and crosses at least 2 water courses which flow directly into the SSSI.
  - a construction compound is proposed to the east of the SSSI and A970, which may include a septic tank to soakaway. As the topography slopes down from the north and east towards the SSSI, it is possible that there is hydrological connectivity from the proposed construction compound location to the SSSI, which would draw nutrients from a soakaway towards the SSSI.
- 5.2 Given the proposed works involving excavation, culverts and waste water in close proximity to the SSSI, there is potential for the SSSI to be adversely affected by:
- sediment release from excavation works (which could smother plants and aquatic species, alter habitats, clog watercourses flowing in the loch and introduce additional nutrients to the loch)
  - alterations to the flow reaching the SSSI caused during construction and by culverting (which could affect water levels and flushing times, having a knock-on effect on the species and habitats present)
  - nutrient enrichment from the waste water at the construction compound (which could alter the sensitive medium nutrient levels of the loch and associated species and habitats)
- 5.3 Although the applicant has proposed mitigation measures for sediment and pollution control within the wind farm boundary, little mention is made of this aspect in relation to the road alterations outwith the boundary. In particular, no recognition is given to the proximity of the Sandwater SSSI to the proposed road alterations and the special consideration that will be required at this location.



5.4 SNH therefore **objects** in respect of Sandwater SSSI. **This objection could be addressed by the application of the following conditions of planning:**

- road alterations must take place to the north side of the existing B9075, so that they do not encroach into the SSSI boundary.
- construction methods, pollution prevention measures and details of water crossings and culverting should be fully agreed with SEPA prior to any works taking place. The construction methods etc, must seek to prevent any additional sediment and/or nutrients reaching the SSSI, and to ensure the flow of water to the SSSI is not altered. These measures should then be fully implemented and controlled by the Ecological Clerks of Works.
- toilet, washroom and kitchen facilities for workers at the construction compound near to Sandwater must be in the form of sealed units (eg “port-a-loos”, portable showers, etc) that must be regularly maintained and emptied to ensure no waste water spills from them. (This would also be beneficial at the other construction compounds within the development site, to prevent nutrient enrichment of otherwise nutrient poor habitats.)

## 6. APPRAISAL FOR PROTECTED SPECIES

6.1 Signs of otter were found within the development site. Regulations 39 and 43 of The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (Habitats Regulations) provide full protection for certain animal and plant species. Otter are a European Protected Species (EPS) and are listed on Schedule 2 (animals) of the Habitats Regulations. In relation to otter, this means it is illegal to:

- deliberately or recklessly capture, injure or kill a European protected species of wild animal or to deliberately or recklessly
  - i) harass an animal or group of animals;
  - ii) disturb an animal while it’s occupying a structure or place used for shelter or protection;
  - iii) disturb an animal while it is rearing or otherwise caring for its young;
  - iv) obstruct access to a breeding site or resting place, or otherwise deny the animal use of the breeding site or resting place;
  - v) disturb an animal in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs;
  - vi) disturb an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young;
- damage or destroy the breeding sites or resting places of such animals

6.2 Where it is proposed to carry out works that will affect European protected species or their shelter/breeding places, whether or not they are present in these refuges, a licence is required from the licensing authority (in this case the Scottish Government).

6.3 The otter survey carried out by the applicant appears to be satisfactory. Although signs (eg spraints) were found within the survey area demonstrating that otter pass through the area, no otter holts or resting places were found. This is consistent with our knowledge of the area and the behaviour of otters in Shetland, which tend to breed on the coast. **SNH therefore does not object in relation to otter, but recommends a condition of planning (6.4) and offers additional advice (6.5 and 6.6):**



- 6.4 **As otters pass through some of the proposed development site, SNH recommends a condition of planning that at the end of each day, pipe ends should be covered to prevent otter (or any other animals) from entering the pipes and becoming trapped, and planks should be placed in excavations and other construction holes to allow otter (or any other animals) to climb out so that they do not become trapped.**
- 6.5 **We also advise that all contractors are made aware of the possible presence of otter passing through the site and the law for EPS, and that should a holt be found then all works within 250mtrs of the holt should stop immediately and the local SNH office contacted for advice (in this case the SNH Lerwick office).** This is to protect otter and ensure that no offences are inadvertently committed.
- 6.6 The Confidential Annex containing the otter survey states at point 182 *“it is recommended that prior to any construction work being undertaken that an application is made for an EPS licence.”*. **SNH advise against applying for a licence as a precautionary measure**, as the current survey results show that the proposed development is not likely to result in actions contrary to the species protection elements of the Conservation (Natural Habitats &c.) Regulations 1994 (as amended), and as such a licence is not required.
- 6.7 No other specially protected species were found within the survey area and as such we have no comments to make on any other non-avian protected species.

## **7. ORNITHOLOGICAL APPRAISAL**

- 7.1 SNH opinion is that the ornithological sections of the ES were of mixed quality. Some aspects were very good, with others lacking depth and clarity. For example the red throated diver sections were very good, and the detect-ability studies very useful. However there are significant deficiencies, for example none of the wind farm infrastructure is marked on the bird figures (making assessment of the impacts in specific areas extremely difficult), it is not possible to verify many of the calculations made, the judgement/discussion of analysis of significance is scant and in some cases incorrect, and, with the exception of red-throated diver, there is no population modelling presented, etc. Further more detailed comment on the ornithological sections of the ES is presented in Annex III.
- 7.2 Despite the deficiencies in the ES, we were still able to reach an informed conclusion on the basis of the magnitude of the figures presented. Had the predicted collision mortality and displacement figures for the affected species been borderline in terms of significance, we would have sought clarification of a number of points before reaching a conclusion. However, taking the ES figures for collision mortality and displacement effects at face value, our opinion is that the impacts are of such a magnitude that we are able to reach a conclusion without seeking clarification (as it is unlikely that clarification would reduce the impacts sufficiently to allow us to change our view).
- 7.3 We do not agree with the conclusions of the ES that impacts will be of low or negligible significance for many of the species assessed. The predicted losses through displacement and/or collision mortality as presented in the ES are high enough to be of significant concern for the following species: red-throated diver, merlin, golden plover, dunlin, whimbrel, arctic skua, lapwing, curlew and great skua . There is a significant risk that impacts on the scale predicted in the ES will be incompatible with the maintenance of regional populations for each of these species. For arctic skua and whimbrel, which have recently shown population declines in Shetland, such impacts may significantly impede any future recovery.



- 7.4 For red-throated diver and whimbrel, there is a significant risk that the national population will be adversely affected. We understand that provisional results from the 2009 survey (as yet unpublished) for whimbrel have shown a significant regional and national decline in numbers. Red-throated diver showed an overall increase in numbers in the 2006 national survey, but a significant decline in the Shetland isles, their stronghold location (approximately one third of the national population breed in Shetland). Therefore an additional reduction in the numbers of these species in Shetland at the levels predicted in the ES is likely to tip the national red-throated diver population into decline, and is likely to cause the national whimbrel population to further decline and prevent future recovery.
- 7.5 **SNH therefore objects due to the likely long term adverse impacts of the proposed development on the favourable conservation status of merlin, golden plover, dunlin, arctic skua, lapwing, curlew and great skua at a regional level, and on red-throated diver and whimbrel at a regional and national level.**
- 7.6 We may reconsider our objection should the applicant wish to address the particular concerns contained in Annex III, in the form of a revised ornithological assessment. This should include, where possible, appropriate population modelling for each species, as well as a more rigorous assessment of the significance of effects. The assessment should be set in the context of the need to maintain the favourable conservation status of each species (or not to impede the recovery of species already in decline), as set out in SNH guidance. The additive nature of impacts, and the benefits that could reasonably be expected within the lifespan of the wind farm from the mitigation and compensation proposed should also be taken into account as part of the assessment.
- 7.7 SNH are happy to provide further advice to the applicant on the content of a revised ornithological assessment. **However the applicant should note that, given the magnitude of the collision and displacement figures presented in the ES, SNH advice is that our position may still be one of objection even if this additional work is carried out.**
- 7.8 Should the Scottish Government be minded to grant consent against SNH advice, we wish to advise that the ornithological sections of the ES as currently presented do not contain sufficient clarity of information for us comment fully either on potential methods to reduce or mitigate the predicted impacts of the proposed development, or any potential for a reduction in the size of the wind farm.

## 8. PEAT, HABITAT & FRESHWATER APPRAISAL

- 8.1 On the basis of what is presented in the ES, and what can be interpreted by SNH, the overall habitat/peat impacts of this proposal appear to be comparable, on a proportionate basis, with other wind farm developments in Scotland.
- 8.2 As no sites designated for habitat interests are found within the proposed development boundary, **SNH does not object. However, to ensure that construction impacts on aquatic and terrestrial habitats are kept to a minimum, we recommend that the following should be agreed with SEPA prior to construction starting as conditions of planning:**
- **the issues bulleted in Vol.2, 10.6.1 (e) (“Assumed design, management and mitigation”) should be incorporated into the Construction Method Statement. However, the reference to “waste peat mounding” in the final bullet should be deleted as inappropriate.**



- the development and maintenance of the Geotechnical Risk Register (Appendix 14.1, Section 5.2, page 63).
- the list of measures outlined in Appendix 14.1, section 9, page 70 ('Mitigation'), albeit recognised as currently being incomplete, be incorporated into the Construction Methods Statement.
- the Environmental Management Plan (Vol. 2, 10.7.4)
- the methods outlined in Vol. 2, 14.6.1.c ('Stream Crossings' paragraphs 5-9)
- the mitigation measures to reduce the impacts of construction works on species and habitats outlined in Vol 2, 10.6.1e and 10.7.1-9 (eg the involvement of Ecological Clerks of Works to ensure that micro-siting is carried out to ensure sensitive habitats are avoided, etc)

8.3 We also provide advice in Annex IV to further reduce impacts and secure benefits for wider countryside habitats.

8.4 In relation to the proposed water crossings within the development boundary, SNH welcome the thorough approach taken by the applicant in seeking to minimise water crossings and the impacts on the water environment. (note however this is not the case for associated works outwith the development boundary – see section 5 of this letter relating to Sandwater SSSI).

8.5 With regard to the above and in relation to Vol.2, 14.6.1.b 'Monitoring Activities', as the regulation and monitoring of soil, water and pollution related issues falls under the remit of SEPA, our advice is that we would expect the applicant to liaise with SEPA on these matters. We would only expect to be consulted where a designated site or protected species/habitat were affected.

8.6 We understand that borrow pits used for peat disposal would be classed as landfill by SEPA. Therefore, in relation to Vol.2, 10.7.8 'Borrow pit working', this would fall under the remit of SEPA and as such we would expect the applicant to liaise with SEPA on this. This includes borrow pit restoration where pits have been used for landfill of peat waste. We would only expect to be consulted where a designated site or protected species/habitat were affected.

8.7 We note the intention of the applicant to use non-native tree planting as screening for some elements of the proposed development (Vol.2, 9.6.3.a). **SNH advises against this approach.** This is for a number of reasons:

- there is unlikely to be a natural heritage benefit for resident Shetland species from the introduction of non-native trees
- there may be a risk from the introduction of invasive species
- given the challenging environmental conditions found in Shetland, it is likely that growth will be severely stunted if not unsuccessful, particularly as no mention is made within the ES as to providing protection and maintenance
- although the aim may be to provide screening which is to be commended, the result is likely to be a visual distraction drawing attention to the structures the trees are planted to hide.

**We therefore advise that the applicant should consider other methods of screening/visual impact reduction through suitable design and location.**



8.8 The net effect of this development on the scale of Scotland's carbon emissions is clearly crucial to the Scottish Government's consideration of this proposal. Although it is not currently within the remit of SNH to advise on the carbon budget calculation itself, our advice on the ecological assessment may help the Scottish Government to evaluate the validity of the input parameters for the carbon budget model. We offer the following observations on the ecological assessment that we feel are of relevance to the carbon budget calculations: there are a number of inconsistencies and areas requiring clarification/verification, which mean that figures taken from the ES and used for the carbon budget calculation may be invalid. For example, it is our view that points 1 – 5, 7 – 9, 12 – 13, 32 outlined in Annex IV require clarification to enable a suitable carbon budget assessment to be made.

## **9. ECOLOGICAL CLERKS OF WORKS**

9.1 Due to the scale of the development, **SNH advises a condition of planning that requires the applicant to employ at least one independent full-time site-based Ecological Clerk of Works per wind farm sector (ie a minimum of 4), overseen by an Environmental Manager, all of whom have the authority to stop work when required (ie should an unexpected event occur that could cause environmental damage).**

9.2 Their role should include overseeing all ecological issues during construction, eg implementation of ecological mitigation and enhancement measures, compliance with pollution prevention and control, etc. The Ecological Clerks of Works and Environmental Manager should be suitably qualified and experienced.

## **10. ACCESS AND RECREATION**

10.1 We welcome that the applicant has made provision for access and recreation through the development area. This is particularly important for a development such as this covering a large area of an island location.

10.2 Our advice is, with reference to the Land Reform (Scotland) Act 2003, that where access needs to be restricted for health and safety or other overriding reasons during or post-construction, appropriate signage that complies with the Scottish Outdoor Access Code guidance should be used. Guidance on the Code and appropriate signage can be found on the Scottish Outdoor Access Code website:  
<http://www.outdooraccess-scotland.com/default.asp?nPageID=321&nSubContentID=0>

## **11. DECOMMISSIONING**

11.1 We agree with the position taken in the ES (Vol. 2, 10.7.4) with respect to decommissioning in that environmental conditions, laws and techniques will invariably change during the time between construction and decommissioning.

11.2 We therefore advise that an additional consultation should be carried out well in advance of the year of decommission to ensure all natural heritage considerations are taken into account.

11.3 Further survey work may be required in the year or more prior to decommissioning to fully assess the likely natural heritage impacts and ensure compliance with the relevant legislation. We would be happy to advise the applicant on this at the appropriate time.





## 12. CONCLUDING REMARKS

- 12.1 As with all applications which are subject to an objection from SNH, we ask to be advised at the earliest possible stage about any proposed modifications, conditions or legal agreements relevant to our interests.
- 12.2 Should you have any queries about this letter, please contact **Nina Turner, Renewable Energy Casework Advisor (North)** in the first instance, based at **SNH, Great Glen House, Leachkin Road, Inverness, IV3 8NW**, telephone 01463 725216.

Yours sincerely



**SUSAN DAVIES**  
**DIRECTOR, OPERATIONS NORTH**



## Annex I – SNH Appraisal of Designated Sites Within 10km

We consider that the below listed sites designated for nature conservation are sufficiently far from the proposal and/or have no connectivity to the development areas, so will not be affected by the proposed development as described in the ES. The following sites were therefore not considered further during our assessment:

- Yell Sound Coast Special Area of Conservation (SAC)\*, approximately 2km to the east and north of Delting, designated for the qualifying interests of common seal and otter. The Yell Sound Coast SSSI is a component part of the SAC, and is designated for otter
- Sullom Voe SAC\*, approximately 2km to the west of Delting, designated for the qualifying interests of lagoons, reefs and shallow inlets and bay  
*(\*as requested in your letter of 22 May, Annex II outlines why we consider neither of the SACs likely to be affected and therefore why an Appropriate Assessment is not required)*
- Burn of Valayre SSSI approximately 1.5km to the west of Delting, designated for the notified feature of broad-leaved, mixed and yew woodland scrub
- Laxo Burn SSSI approximately 2km south east of Nesting, designated for the vascular plant assemblage notified feature
- The Ayres of Swinister SSSI approximately 2km to the east of Delting, designated for its geological notified feature
- Quoys of Garth SSSI approximately 1.5km to the north west of Delting, designated for its geological notified feature
- Voxter Voe and Valayre Quarry SSSI approximately 1.5km to the west of Delting, designated for its geological notified feature
- Dales Voe SSSI approximately 1km to the east of Delting and 2km to the north of Collafirth, designated for the notified feature of saltmarsh
- Burn of Lunklet SSSI approximately 1km to the north of Kergord, designated for the notified feature of vascular plant assemblage
- Kergord Plantations SSSI, designated for its broad-leaved, mixed and yew woodland notified feature. The SSSI comprises 10 component parts, the closest being adjacent to one of the access tracks to the Kergord development site and the furthest 1.2km to the south of Kergord
- Catfirth SSSI approximately 3km to the east of Kergord and 6km to the south of Nesting, designated for its broad-leaved, mixed and yew woodland notified feature
- Loch of Girlsta SSSI, approximately 3km to the south east of Nesting and 5km to the east of Kergord, designated for Arctic charr and mesotrophic loch notified features

## Annex II – SNH Appraisal of European Interests

### European Sites

The below European designated sites are in proximity to the proposed development areas:

- Yell Sound Coast SAC, approximately 2km to the east and north of Delting sector, designated for the qualifying interests of common seal and otter
- Sullom Voe SAC, approximately 2km to the west of Delting sector, designated for the qualifying interests of lagoons, reefs and shallow inlets & bay

The conservation objectives for the SACs are:

- to avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features;

and

- to ensure for the qualifying species that the following are maintained in the long term:
  - population of the species as a viable component of the site
  - distribution of the species within site
  - distribution and extent of habitats supporting the species
  - structure, function and supporting processes of habitats supporting the species
  - no significant disturbance of the species

### Legislative Requirements for European Sites

The sites' status as SACs under the EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (the "Habitats Directive") means that the Conservation (Natural Habitats, &c.) Regulations 1994 as amended (the "Habitats Regulations") apply. The requirements are summarised in Circular 6/1995 as amended June 2000 and include, at paragraph 12, *"The Regulations (48) require that, where an authority concludes that a development proposal unconnected with the nature conservation management of a Natura 2000 site is likely to have a significant effect on that site, it must undertake an appropriate assessment of the implications for the conservation interests for which the area has been designated."*

Under regulation 48 of the Habitats Regulations, this means that the Scottish Government, as competent authority, has a duty to:

- determine whether the proposal is directly connected with or necessary to site management for conservation; and, if not,
- determine whether the proposal is likely to have a significant effect on the site either individually or in combination with other plans or projects; and, if so, then
- make an appropriate assessment of the implications (of the proposal) for the site in view of that site's conservation objectives.

### SNH Advice in Relation to the Qualifying Interests

From the information available it appears to SNH that the proposal is not connected with or necessary for the conservation management of the SACs. Hence, further consideration is required. **However, we consider that it is unlikely that the proposal will have a significant effect on any of the qualifying interests either directly or indirectly and in our view an appropriate assessment is therefore not required.** This is because we consider that the qualifying interests of common seal, lagoons, reefs, inlets & bays are sufficiently far enough away from the proposal and/or have no connectivity to the development areas, so will not be affected by the proposed development as described in the ES. Although there is evidence of otter recorded within the development areas, we do not consider them to be SAC otters, but from the wider countryside population. This is because monitoring and other evidence indicates that the SAC otters are predominantly coastal and feed mainly in the sea. The proposal is also unlikely to affect SAC otter holts, as these tend to be on the coast or at most 1km inland, which is outwith the development area.

## Annex III – SNH Appraisal of Ornithological Sections of the ES

We have the following advice and comments on the ornithological sections of the ES, including points that would benefit from clarification should a revised ornithological assessment be deemed appropriate. However, as outlined at point 7.7 of the accompanying letter, **we would not expect the applicant to carry out further work to clarify these points unless they are confident that the favourable conservation status of the regional and/or national populations can be shown to not be adversely affected.**

Should a revised ornithological assessment be deemed appropriate, SNH would be content to be involved in a meeting with the applicant/their consultants to discuss the following points further. The SNH point of contact for arranging such a meeting (and should the applicant/their consultant have any other queries) is Nina Turner, Renewable Energy Casework Advisor (North), based at SNH, Great Glen House, Leachkin Road, Inverness, IV3 8NW, telephone 01463 725216.

### 1. General comments on the ornithological sections and methodologies used

- 1.1 The ornithological sections of the ES and the Birds Technical Report are logically structured, the text is well written and easy to navigate. However there were some crucial omissions and inadequacies that made making an assessment of the impacts of the proposed development difficult.
- 1.2 For example, in the ES none of the bird maps show any of the proposed wind farm infrastructure. This is contrary to good practice and makes it extremely difficult to check if there are any concentrations of ornithological interest that could be affected by particular access tracks or turbines. It is also not possible for SNH to provide advice on the implications of disturbance to nesting birds as suitably scaled maps are not provided showing the nesting locations. Disturbance to nesting birds is likely to be a significant challenge for the applicant in relation to the requirements of the Wildlife & Countryside Act (1981) as amended.
- 1.3 Similarly, it is disappointing that flight line maps were not presented for more species. This would assist in assessing the potential impacts on local concentrations of birds.
- 1.4 Methods used to ascertain the diversity and abundance of breeding birds on site were satisfactory and are generally in line with SNH guidance<sup>1</sup>. However, the reliability of the Brown & Shepherd breeding bird surveys was reduced because two, rather than the three recommended in SNH guidance, field visits were carried out. Between-year variability is addressed, but a more detailed presentation of the derivation of confidence limits would be appropriate.
- 1.5 Some elements of the ES go well beyond what is normally presented in wider-countryside wind farm applications. The extra information provided by these studies is welcomed by SNH, and will be of real assistance in the assessment of other wind farm applications. Included in this category are the distance-detection studies for eight species, which were then used to correct the flight activity rates for bird detectability. Unfortunately however the method by which 'Effective Total Detection Distance' (ETDD; Appendix 11.1, paragraph 118) was calculated is not described very clearly and therefore cannot be verified.
- 1.6 Equally, the calculations used to correct the flight activity records are not detailed in the ES, so are impossible to verify.

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<sup>1</sup> SNH 2006. Assessing significance of impacts from onshore wind farms on birds outwith designated areas. SNH guidance note, July 2006.

## Annex III – SNH Appraisal of Ornithological Sections of the ES *continued*

- 1.7 It appears that merlin and red-throated diver were identified from the outset as species likely to give rise to significant concern. Significant resources were invested in bespoke studies on these two species. The detailed assessments presented for these species are welcomed by SNH.
- 1.8 The separate surveys for migratory movements, autumn and winter surveys, wintering and passage whooper swan counts, and roosting hen harrier counts are welcome additions to the ES. Coverage of the targeted interests is satisfactory and the results are clearly reported.
- 1.9 Landform-association studies were carried out for whimbrel and golden plover. Again, this is very welcome work, but it is unclear to what extent this work informed the final selection of turbine locations.
- 1.10 The conduct of the vantage point (VP) surveys is clearly described. It is clear that a large amount of effort has been invested in the generic VP work. Quoted spatial coverages were 78.4% and 73.5% for the western and eastern survey areas respectively, however this does not mean that the actual envelope of the proposed turbines (ie the risk area) received this level of coverage for the following reasons:
- the selection of viewpoint locations is questionable as many were located within the turbine envelope (contrary to SNH guidance), whilst the viewsheds of ten others (numbers 7, 10-13, 15-17 & 30-31) contain little or none of the bird collision risk area. This could have arisen if turbine locations were changed after the VPs were selected and the VPs were not reviewed to account for this.
  - details of individual VP watches are not tabulated, so it is not possible to confirm whether there were any concurrent watches, or other facets of observer behaviour which could have affected the rate of observed flight activity.
  - the quoted coverage for viewsheds are plotted out to 2.5km, exceeding the SNH-recommended maximum of 2.0km.
  - the results of the distance-detection study suggest that, for species other than great skua, few flights would be detected at distances exceeding 1km from the observer.
- 1.11 Taken together, the above listed factors reduce the extent to which flight activity over the actual turbine locations has been recorded, and it is difficult to confirm whether or not the at-risk area was adequately covered by VP watches. This is important because, for each species, the flight occupancy rate of the at-risk airspace is a crucial part of the collision risk calculation. The calculation methods for flight occupancy rates are not presented (except for red-throated diver and merlin), and the rates presented therefore cannot be verified from the information contained in the ES.
- 1.12 There are some significant areas of uncertainty in the ES which reduce the confidence of the impact assessments from habitat loss. Chief of these is the unresolved matter of peat disposal. One of the suggested options is spreading or mounding amounts of peat alongside the access tracks. This option appears not to have been considered in the assessment of direct habitat losses. The potential therefore exists for the impacts due to land take and habitat modification to be greater than those presented and considered in the ES. In addition, different figures are presented in the ES for the widths of the access tracks, giving further uncertainty with respect to the extent of direct habitat losses. There is also no consideration of direct habitat losses which are likely to occur through the undergrounding of electricity cables.



## **Annex III – SNH Appraisal of Ornithological Sections of the ES *continued***

- 1.13 No assessment has been made of the potential impacts of the permanent and temporary guyed meteorological masts from habitat loss and collision risk. This is an important omission, particularly given the expected difficulties in fitting deflectors to guys in Shetland, meaning that the collision risk is likely to be greater than at other wind farms.
- 1.14 It is not possible to verify the collision risk calculations presented in the ES due to the unusual way they are described as being calculated and the lack of presentation of the actual calculations.
- 1.15 The ES uses an avoidance rate of 98% for collision risk modelling for all species where it had been undertaken, which is contrary to SNH guidance (except for greylag goose, which was correctly assessed at the SNH approved rate of 99%). For red-throated diver, 98% represents a rate that SNH has formally agreed elsewhere. For hen harrier 99% is the recommended rate. SNH however currently uses a default 95% avoidance rate for all other species assessed in the ES.
- 1.16 Predicted collision mortality is increased by a factor of 2.5 if calculated using 95% avoidance. For instance, the number of great skua predicted to be killed would increase from 60.2 individuals per year (the figure used in the ES) to 150.5 individuals per year.
- 1.17 SNH however recognises that a range of recent empirical evidence suggests that 95% is likely to be too low (that is, too precautionary) for species where this has been assessed at other wind farms so far. We are therefore currently considering raising the 'default' avoidance rate from 95%. Nevertheless, significant doubt remains as to the true avoidance rate for species such as curlew, whimbrel, dunlin, lapwing, great skua and arctic skua, largely because few large-scale wind farms have been proposed or constructed in areas holding large populations of these species.
- 1.18 Notwithstanding points 1.15 – 1.17 above, our opinion is that no matter what avoidance rate is used (95% or 98%, or figures in between), the predicted mortality rates for golden plover, dunlin, arctic skua, lapwing, curlew and great skua are at such a level as to be detrimental to the regional populations, and for red-throated diver and whimbrel detrimental to the regional and national populations (especially when combined with the predicted disturbance figures).

### **2. Assessment of effects upon breeding bird species, including proposed mitigation**

- 2.1 The Evaluation of Significance set out in chapter 11 of the ES is well structured. Paragraph 11.6.3 on the categorisation of effects is logically argued, but contains several elements that go well beyond what has been agreed between SNH and the industry, or incorporated into SNH guidance. We are therefore at present, unable to agree to the detailed provisions of paragraph 11.6.3 ("Methods used to Evaluate the Magnitude of Effects").
- 2.2 There appear to be two major, generic problems with the way that judgements on the significance of the impacts have been made:
- i) disturbance and collision effects are presented solely in terms of the percentage of the regional population affected. There is very little, if any, discussion of regional or national population status for any species, or consideration of whether the predicted effects are likely to have deleterious population consequences at the regional and/or national level. This approach is too simplistic, and is contrary to SNH guidance, which states that information is needed on the number, trends and distribution of each species, and natural mortality and productivity data were available - in other words, a population dynamics approach.

## Annex III – SNH Appraisal of Ornithological Sections of the ES *continued*

- ii) for each species, a judgement on significance is made for each impact in isolation, without any consideration of additive impacts. Thus, the effects of land take, habitat modification, construction disturbance, operational disturbance and collision mortality are assessed individually, when a more appropriate analysis would consider the effect of each impact added to the preceding ones. The caveat here is that operational disturbance and collision mortality tend to act in opposition to one other, but the extent of this has not been accurately quantified for any species. Therefore an appropriate precautionary approach is to assume that operational disturbance and collision mortality apply additively. Should a revised ornithological assessment be carried out, the operational disturbance and collision mortality effects should, where possible, be analysed together within population models to examine the overall effect upon favourable conservation status of the regional or national population of each species.

2.3 As stated in 7.3 of the accompanying letter, we do not agree that impacts will be of low or negligible significance for many of the species assessed in the ES:

- i) The predicted losses through disturbance and/or collision mortality as presented in the ES are high enough to be of significant concern for the following species: red-throated diver, merlin, golden plover, dunlin, whimbrel, arctic skua, lapwing, curlew and great skua. We consider that the likely impacts of the proposal will adversely affect the national and regional populations of whimbrel and red-throated diver, and the regional populations of merlin, golden plover, dunlin, curlew, lapwing, arctic skua and great skua. Points 3 and 4 of this Annex provide further detail on our appraisal of the likely regional and/or national impacts for each of these species.
- ii) The Habitat Management Plan is unlikely to significantly reduce the predicted impacts of the proposal on these species, and may actually work against golden plover and whimbrel, both of which prefer relatively close-grazed areas.
- iii) For these reasons, in our view, there is a strong likelihood that the impacts will adversely affect the long term favourable conservation status of red-throated diver, merlin, golden plover, dunlin, whimbrel, arctic skua, lapwing, curlew and great skua. Therefore, it is incorrect to assess the impacts on these species as low or negligible.

2.4 For information and by way of comparison, the predicted collision mortality figures are much higher than SNH have seen for other wind farms that we have been involved with. For example, the predicted collision mortality figures for Viking are much greater than those predicted for the Lewis wind farm proposal (Scottish Government decision letter 21 April 2008). The Lewis wind farm was a larger but comparably sized development of 181 turbines at 140mtrs height (compared to 150 turbines at 145mtrs for Viking). As an example, the predicted number of collisions (at 98% avoidance) for red throated diver for Viking is 6.06 birds per annum compared to 0.71 for Lewis, and for golden plover the figure is 62.46 birds per annum for Viking compared to 0.9 for Lewis. (Lewis figures taken from Appendix 12 H, Collision Risk Analysis and Population Viability Analysis for the Proposed Lewis Wind Farm (2006). LWP.)

### 3. Species likely to be affected at a national and regional scale

3.1 SNH considers that red-throated diver and whimbrel will be adversely affected at a **national level**. Both red-throated diver and whimbrel are species of conservation concern: Whimbrel is a red list species of national (GB) conservation concern in the BTO 'Species of Conservation Concern 2009', with red-throated diver being on the amber list. Red list species are those being globally threatened and/or showing a severe decline the UK population size and/or range, with amber list species being of European conservation concern and/or showing a moderate decline in the UK population and/or range.

## Annex III – SNH Appraisal of Ornithological Sections of the ES *continued*

- 3.2 The red-throated diver is a scarce breeding bird which nests at small lochans, with approximately 1255 pairs nesting in Britain<sup>2</sup>. Shetland is important for this species, as it supports around one-third of the British population. The collision mortality is predicted to be 2.6 breeding adults per year and 3.5 non-breeding birds per year. These figures are very much higher than has been predicted for any other wind farm that SNH have been involved with, including the comparably sized Lewis proposal (which predicted 0.71 red-throated divers per year). Red-throated divers are long-lived, do not start to breed until they are up to 5 years old, and successfully raise (on average) less than one young per pair per year. Species with these characteristics are sensitive to additional mortality, particularly of adult birds. **SNH therefore considers that the predicted levels of annual collision mortality combined with the predicted permanent loss of 10 pairs through operational disturbance, pose a significant risk of causing a long-term population decline for red-throated diver in Shetland. Given the regional decline in red-throated diver numbers in Shetland in recent years, such additional pressure may also cause a national decline.**
- 3.3 The whimbrel is a scarce upland-nesting wading bird, with nearly all of the national population nesting in Shetland. Provisional as yet unpublished results from a national survey in 2009 indicate that the whimbrel population has declined by up to 39% since the last assessment during 1989-1992<sup>3</sup>. This means that the ES is likely to present a significant underestimate of the impacts on this species (for example, 40 pairs of Whimbrel lie within the assumed construction displacement zone, which is about 8% of the national population based on the 1989-1992 estimate, but as much as 13% of the national population based on first reports from the 2009 census). The ES suggests that 15 pairs per year could be affected by reduced productivity through construction disturbance. SNH considers that this figure could be higher depending on the phasing of construction, and that territory abandonment during construction is also possible. In addition to construction disturbance, 16 pairs of whimbrel are predicted to be displaced as a result of disturbance during operation of the wind farm - these pairs should be considered to be lost from the population and constitute approximately 5.3% of the national population (2009 figures). **SNH therefore considers that the combined effects of disturbance and collision mortality would add substantially to the difficulty of reversing the decline in the national population of whimbrel.**
- 4. Species likely to be affected at a regional scale**
- 4.1 SNH considers that arctic skua, lapwing, dunlin, merlin, golden plover, curlew and great skua are likely to be adversely affected at a **regional level**. Arctic skua, lapwing and dunlin are red list species of national (GB) conservation concern in the BTO 'Species of Conservation Concern 2009', with merlin, golden plover, curlew and great skua being on the amber list. Red list species are those being globally threatened and/or showing a severe decline the UK population size and/or range, with amber list species being of European conservation concern and/or showing a moderate decline in the UK population and/or range.
- 4.2 The table overleaf provides disturbance and collision mortality figures for the species we consider likely to be affected at the regional scale by the proposal. In accordance with SNH guidance, the regional scale is taken as the Natural Heritage Zone of the Shetland Islands. Population figures are taken from ES. Collision mortality is presented at a 98% avoidance rate as used in the ES:

<sup>2</sup> Dillon, I. et al 2009. Status of Red-throated Divers *Gavia stellata* in Britain in 2006. Bird Study 56: 147-157.

<sup>3</sup> Baker, H. et al (2006). Population estimates of birds in Great Britain and the United Kingdom. British Birds 99: 25-44.

## Annex III – SNH Appraisal of Ornithological Sections of the ES *continued*

Species	Shetland population estimate no. of pairs	Construction disturbance, predicted no. of pairs (% Shetland population)	Operational disturbance, predicted no. of pairs (% Shetland population)	Collision mortality, predicted (no. of birds per annum*)
Merlin	20	2 (10%)	2 (10%)	0.36 (0.9%)
Golden plover	1450	30 (2.1%)	35 (2.4%)	62.5 (2.2%)
Lapwing	1740	20 (1.1%)	13 (0.7%)	not calculated
Dunlin	1700	14 (0.8%)	32 (1.9%)	14.3 (0.4%)
Curlew	2300	75 (3.3%)	93 (4.0%)	58.4 (1.3%)
Arctic skua	1128	negligible	13 (1.2%)	10.1 (0.4%)
Great skua	6874	negligible	negligible	60.2 (0.4%)

### 4.2 There is a significant risk that the impacts of the proposal will adversely affect the favourable conservation status of the regional populations:

- for merlin, we consider that the loss of 10% of the regional population through disturbance alone would not be compatible with maintaining the favourable conservation status of the merlin population in Shetland.
- for great skua, we consider that the predicted annual collision mortality is of concern because of the delayed age of first breeding, long life and relatively low annual productivity of the species, making it particularly sensitive to additional mortality.
- for arctic skua, the combined effects of disturbance and annual collision mortality should be more thoroughly re-assessed in the context of recent national decline of this species.
- for all the other species, there is a significant risk that the magnitude of the combined disturbance and collision mortality impacts will be incompatible with maintaining the favourable conservation status of the species populations in Shetland.

## Annex IV – SNH Appraisal of the Peat and Habitat Elements of the ES

SNH opinion is that the Soil and Water chapter, from a peat and habitats perspective, is adequate and well written, as is the Peat Stability Assessment and the Peat Reuse appendix. However, SNH found the Ecology chapter generally difficult to follow and it also appears to underestimate the likely impacts of the proposed development in relation to peat and habitats. Although not preventing us from reaching an informed decision, we noted a number of inconsistencies and inaccuracies in the ES which the Scottish Government may wish to seek clarification on – these are highlighted by underlining. In particular, a number of the below points (ie 1 – 5, 7 – 9, 12, 13, 32) are relevant to the carbon budget appraisal that we understand will be carried out by the Scottish Government. We also offer advice in **bold** to further reduce the impacts of the proposed development, in addition to the recommended conditions of planning in section 8 of the accompanying letter.

### Chapter 4 - Development Description

1. Section 4.2.2, page 4-3, Turbine foundations. “*The excavation typically would be 3m to 4 m deep by approximately 25 m square*”. As Chapter 14 Soils and Water, Page 14-62 makes clear, 25 m square is the basal dimension, so with a 45 degree slope the excavation would be “*about 31 m across the top*”. This apparent underestimation of impacts recurs in various parts the ES.
2. Section 4.2.3, page 4-3, Tracks. “*Double width construction tracks...with a running surface approximately 12m wide...*”. This is inconsistent with Appendix 14.4 “Estimated Peat Extraction Volume...”, Section 3.1 which states “*Double track – 8m running width*”. Given the significance of the difference and its implications for the footprint of the development, SNH advice is that this apparent inconsistency should be resolved in order that the potential impact of the development can be fully assessed.
3. Also, the ES does not appear to state anywhere why double width construction tracks are required at this site, in contrast to all, or certainly most, other wind farms. It is also not clear whether the width of these tracks will be reduced post-construction. **SNH advises that the need for double width tracks should be reviewed by the applicant and, if they are deemed necessary, that consideration be given to narrowing them post-construction.**
4. Section 4.2.3, page 4-4, Tracks. “*Operational tracks...with a 3.5 m running surface...*”. This is inconsistent with Appendix 14.4 “Estimated Peat Extraction Volume...”, Section 3.1, page 4 which states “*Operational Track – 6m width plus 0.5 m shoulder...*”. Again, SNH advice is that this apparent inconsistency should be resolved in order that the potential impact of the development can be fully assessed.
5. Section 4.2.3, page 4-4, Track Construction. “*On softer areas, typically more than 1.5 m of peat, “Type B” construction will be used*”. [Type B is floating track]. This contrasts with Chapter 14 Soils and Water, Section 14.6.1, page 14-52, “*Floating track will be constructed ...where peat depth is typically greater than 1.0m*”. SNH accepts that it is not possible to be precise at this stage as to exactly where floating tracks will and will not be constructed. However, without some consistent criteria for their construction it is difficult to assess potential construction impacts, or the potential peat surplus as attempted in Appendix 14.4. SNH therefore advises that a greater degree of consistency in describing the criteria for applying different construction methods is required, particularly for developing the Construction Methods Statement, as this has implications for assessing the impacts (and mitigation measures).



## Annex IV – SNH Appraisal of the Peat and Habitat Elements of the ES *continued*

6. Section 4.2.3, page 4-5, Track Construction. “Formation of Type B [floating] track involves:
- Removal and temporary storage of turves, as appropriate
  - .....
  - Removal and temporary storage of adjacent turves...”
- SNH assumes this is an error as it is contrary to good practice. **SNH advice is that turves should not be removed from beneath or adjacent to floating tracks.**
7. Section 4.4.4, page 4-11, (c), Crane pads. “The final size, design and layout would be determined by the turbine supplier...”. Appendix 14.4 “Estimated Peat Extraction Volume...”, Section 3.2, page 5, Turbine Bases, gives dimensions of 1,500m<sup>2</sup> for a permanent installation and 354m<sup>2</sup> for a temporary installation. In assessing the potential impacts of the proposed development the Scottish Government may wish to seek confirmation that these dimensions are approximately correct.

### Chapter 10 - Ecology

8. Section 10.2.1, page 10.1, Study area. “...the proposed development will occupy only approximately 314ha..... This figure is based on the calculation of....and a standard allowance of 0.2ha per turbine (which allows space both for the foundations and for the crane pad)”. However, as indicated above, Chapter 14 Soils and Water, page 14-62 makes clear the turbine excavations are about 31 m x 31 m = 961 m<sup>2</sup>, and Appendix 14.4 “Estimated Peat Extraction Volume...”, Section 3.2, page 5, Turbine Bases gives crane pad dimensions of 1,500m<sup>2</sup> for a permanent installation and 354m<sup>2</sup> for a temporary installation. This totals 2,815 m<sup>2</sup>, ie very nearly 0.3 ha. Furthermore, no mention is made here of such elements of the infrastructure as control buildings, substations and laydown areas. SNH therefore suggests that the actual footprint of the proposed wind farm is likely to be significantly greater than indicated in the ES and recommends that a more accurate estimate be calculated by the applicant to assist in any further assessment made by the Scottish Government.
9. Tables 10.9 - 10.12 ‘Construction and Operational Impacts’ are unclear. The total “Hectares of habitat lost” attributable to construction impacts is stated as 294.75 ha. The total “Hectares of habitat lost” attributable to operational impacts is stated as 245.37 ha. Neither of these figures, nor their total of 540.12 ha reflects the 314 ha presented at Section 10.2.1, page 10.1. In addition, from the way the data is presented there is no way of confirming, or revising, these figures independently. Furthermore, it is not apparent whether these losses are confined to direct losses, or whether account has been taken of indirect losses attributable to habitat change in response to, for example, altered hydrology. The Scottish Government may therefore wish to request a more transparent and consistent approach to habitat loss be presented, in order that losses may be clearly identified, assessments made and appropriate mitigation measures developed.
10. Section 10.6.1 (c), page 10.37, final sentence. “Once the peripheral (buffer) areas ...have been restored, the area that will be covered by hardcore or concrete or turbines, or will consist of quarried ground...will amount to about 252 ha...”. It is not possible to verify this statement, but SNH advice is that it is of limited relevance in determining the potential, or actual, impact of the development.
11. Section 10.6.1 (e), page 10.37. When it is stated that the listed measures are “assumed”, it is not clear whether this amounts to a commitment. SNH have therefore recommended the measures are included as conditions of planning in section 8.2 of the accompanying letter.

## Annex IV – SNH Appraisal of the Peat and Habitat Elements of the ES *continued*

12. Section 10.6.3 'Impacts on Habitats', page 10.40. *"The ... assessment of impacts upon habitats assumes these [design, management and mitigation] measures will be incorporated and implemented fully. If this is not done, the magnitude and significance of predicted impacts on habitats and associated species will likely be greater"*. This approach is unusual and unhelpful for the purposes of assessing impacts. The more usual and transparent approach is to identify and quantify impacts pre-mitigation, describe the mitigation measures, then quantify the residual impacts. The approach adopted in the Viking ES denies assessment of the 'worst case' scenario of no or failing mitigation measures. It is also not possible to assess the efficacy of the proposed mitigation measures, which is not good practice. As already indicated in point 9 in relation to Tables 10.9 - 10.12, the Scottish Government may wish to seek a more transparent approach to habitat loss and mitigation to facilitate a comprehensive assessment of the development.
13. Table 10.18, page 10.41. This table is incomplete as it should include 0.28 ha of Acid Flush as per Table 10.10.
14. Section 10.6.3 Impacts on Habitats, Page 10.42. *"Ponding may occur against the upslope side of mounding created from waste peat from excavations..."*. **SNH advice is that there should be no mounding of waste peat as this may might cause negative environmental impacts (eg by unnecessarily smothering habitat and introducing an additional risk of sediment run off).**
15. Section 10.6.3 Impacts on Habitats, Page 10.47. (d) Negative cumulative impacts. *"Because all the impact magnitude assessments (except one) are low (moderate for blanket bog), no significant negative cumulative impacts are predicted for habitats."* This statement is incorrect in its assumption: It is not an inevitable consequence of low magnitude assessments for (almost) all the features that when considered cumulatively they have no significant negative effect. For example, several low magnitude assessments may result in a significant cumulative effect. That is why assessment of cumulative impacts should be undertaken.
16. Section 10.7, Mitigation, page 10.59. 2nd bullet. SNH advice is that clarification should be sought that this is meant to read 'Reduce negative impacts that could not be avoided'.
17. Section 10.7.6, Potential hydrological changes due to cabling, tracks and trackside drains. 1st paragraph. It is stated that clay bunds "may" be installed in cable trenches to minimise groundwater flow downslope. **SNH advice is that clay bunds, or some similar measure, should be installed in all cable trenches to minimise groundwater flow downslope.**
18. Section 10.7.6, Potential hydrological changes due to cabling, tracks and trackside drains. 3<sup>rd</sup> paragraph. *"There will be no mounding or spreading of waste peat in the track side areas where surface flows will be impeded"*. Although inconsistent with the remark at Section 10.6.3 Impacts on Habitats, Page 10.42 (point 14 above), this commitment is welcomed by SNH.
19. Section 10.7.9 Habitat mitigation and compensation (a) Habitat compensation, page 10.63. *"The only compensation considered necessary is for the predicted 197ha of blanket permanently lost as a consequence of the wind farm construction. A neutral response would seek a like for like replacement of predicted habitat loss. The compensation proposed in the HMP is for twice the area lost"*. SNH does not agree with this statement for the reasons detailed overleaf:
  - blanket bog and other habitats will be reduced in extent and so a 'full' compensation plan should include all habitats, not just blanket bog

## Annex IV – SNH Appraisal of the Peat and Habitat Elements of the ES *continued*

- table 10.18 (page 10.41) gives the area of “*direct construction habitat loss*” for blanket bog as 238ha. Clarification should be sought as to why only 197ha is being compensated.
- a neutral response is not necessarily simply ‘a hectare for a hectare’ as issues of continuity/fragmentation/disposition are also relevant.
- the Habitat Management Plan (HMP) does not propose compensation of 394 ha. It proposes compensation of 252 – 314 ha as a pilot, with the objective of extending the restoration programme over the life of the wind farm.

### Appendix 10.9 – Habitat Management Plan

SNH welcomes, in principle, the proposals contained within the HMP. At best, they could make a substantial contribution to safeguarding habitat and species interests in the area. However there are a number of issues that require further consideration by the applicant:

20. Section 4.2, Grazing, page 12. While fencing will almost certainly be essential to control/exclude grazing, **SNH advises that the applicant should give consideration to the impacts such fencing may cause, eg increased erosion from tracking along the fence line, increased grazing pressure outside enclosures, etc.**
21. A sheep stocking density of 0.5 sheep/ha in the summer and 0.25 sheep/ha in the winter seems high. As stated in the ES, complete removal of sheep in over the winter would be preferred, and may be essential.
22. Section 4.3.1.1, Peat, page 14. It is not clear whether the “sand bags” proposed are of natural fibre (eg hessian) or man-made (eg polypropylene). **SNH advises that consideration should be given by the applicant as to the life-expectancy, appearance and breakdown products of all introduced materials and efforts taken to use the most sustainable, least visually intrusive materials.**
23. Section 4.3.2, Damming large erosion gullies. SNH advice is that this should be tackled very cautiously. Damming many small gullies is likely to be more beneficial and cost-effective than damming a few large ones.
24. Section 4.4.2, Lochan Enhancement Techniques. The enlargement of existing or creation of new lochans is a high risk strategy. **SNH advice is that this should only be considered after the safeguarding and restoration options at existing lochans have failed demonstrably.**
25. Section 4.8, Trials. It is important that an evaluation process and success criteria are established prior to commencement of any trials.
26. Section 6.1, Selection and management of the pilot area. 3<sup>rd</sup> bullet. “*Area at least sufficient to compensate for the direct impact (footprint) ....which is 314ha reducing to 252ha after recovery of disturbed vegetation*”. This is not strictly accurate. According to Chapter 10 Ecology Section 10.6.1, page 10.37, the 252 ha is the area that will be under hardcore, concrete etc. It does not account for losses to, for example drains, or to the effect of drains converting one habitat to another. Therefore, if a strictly numerical approach is adopted (and SNH does not favour such an approach) then a larger compensation area than that described in the ES is required.

## Annex IV – SNH Appraisal of the Peat and Habitat Elements of the ES *continued*

27. Table 8, “Preliminary list of management objectives.....”, page 35. While SNH is in principle content with the objectives, their achievement is entirely dependent on the goodwill and cooperation of the various land owners/managers. It is not clear how this goodwill and cooperation is to be secured for the appropriate time periods. **Should the anticipated land area for the HMP not be secured, SNH advice is that similar restoration management is sought and achieved elsewhere in Shetland.**

### Chapter 14 - Soil and Water

28. Section 14.6.1, Basis of assessment (b) Assumed design, management and mitigation measures. *Site Tracks*, page 14.52. “ *To maintain the surface flow the base layers of the floating track will be made as permeable as possible, using large-sized aggregate which will allow surface water to percolate through the base of the track*”. **Given the potential for large sized aggregate to compromise the effectiveness of the basal geogrid in securing interlock, SNH advises that priority be given to ensuring stability of the floating track and, if necessary, employing other means of enabling water to flow across the line of track.**

29. Page 14.61 *Sediment Management* and Diagram 14.1. **SNH advises that cut-off drains upslope of turbine excavations (and borrow pits) should be restored once the potential for surface flow to compromise construction activity ceases. SNH further recommends that low ground-pressure vehicles are used to install and re-instate these drains.**

### Appendix 14.1 Peat Stability Assessment

30. Table 5, page 58. It is not clear what the figures in brackets represent. It may be that they indicate how the *Indicative Peat Depth Map* describes the *actual* peat depth points, but this not stated.

31. Section 5.2, page 63. “*The results demonstrate that the majority of the wind farm infrastructure will be built in areas where there is a degree of comfort in inferring stability*”. It is important to note that this stability relates to the current state of the ground, not any altered state arising from wind farm construction which, as stated in the Introduction (Section 1, page 1) is the topic under investigation. This should be made more explicit in the analysis. **SNH advises that the Geotechnical Risk Register (the development and maintenance of which is recommended in section 8.1 of the accompanying letter as a condition of planning permission) fully acknowledges the distinction between baseline risk and additional risk imposed by wind farm construction, and that suitable mitigation measures are developed for the latter.**

32. Table 9 and following paragraph, page 65. Table 9 identifies 1392 grid cells with a ‘Significant’ Hazard Ranking, and 60 with a ‘Substantial’ Hazard Ranking. SNH assumes that the reason only 272 cells, grouped into 51 areas, are identified as meriting further discussion, is that the other grid cells with Significant or Substantial Hazard Ranking do not coincide with proposed wind farm infrastructure. SNH advice is that it may be helpful for the Scottish Government to have the applicant confirm or otherwise clarify this point.

33. Page 70, Section 9, Mitigation. 10<sup>th</sup> bullet. “*Earthmoving activities will be restricted during and immediately after intense and prolonged rainfall events*”. **SNH advice is that the “intense and prolonged rainfall events” terms should be defined, to avoid the risk of variable interpretation.**

### Appendix 14.4 - Estimated Peat Extraction Volume and Potential Reuse Options

34. Section 7.5, Peat Spreading. SNH welcomes the recommendation that this option is not viable for the Viking wind farm.

## Annex IV – SNH Appraisal of the Peat and Habitat Elements of the ES *continued*

35. Section 7.6, Domestic Fuel Use. **SNH advice is that this option may be more complex than presented in the ES and recommends further investigation by the applicant before it is pursued.** For example, measures would need to be put in place to ensure that only peat that would have been excavated anyway is removed, to ensure that the 'footprint' of the wind farm is not inadvertently increased, that ecology, hydrology, peat stability, etc are not adversely affected, and that there are no indirect impacts on the construction works themselves.
36. Section 7.7, Commercial Fuel Use. SNH agrees that there may be logistical and practical difficulties with this option and it is not one which we would wish to see pursued.
37. Section 7.8, Dry Soil Mixing and Stabilisation of Peat. SNH welcomes the recommendation that this option is not considered for the Viking wind farm.
38. Section 7.9, Commercial Horticulture. SNH welcomes the recommendation that this option is not pursued any further for the Viking wind farm.
39. Section 7.9, Off-site Infill. SNH welcomes the recommendation that this option should not be pursued. However, given the volumes of extraction involved, we recognize that is likely to be one of the very few options for peat disposal available to the applicant, should consent be granted.

