Marian Deeney
The Scottish Government Energy Directorate
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

17 November 2010

Dear Ms Deeney,

Re: Addendum to the application, by the Viking Energy Partnership, under Section 36 of the Electricity Act 1989 to construct and operate a wind farm at the mainland of Shetland.

The Scottish Wildlife Trust originally objected to the planning application which was submitted by the Viking Energy Partnership in May 2009.

At the time, our main reasons for objecting to the proposed wind farm were three fold: we did not believe the mitigation / offsetting / enhancement measures, as described in the Environmental Statement (ES), would produce a net benefit in respect to blanket bog, a priority habitat under Annex I of the EC Habitats Directive, which covers the majority of the proposed wind farm site. We were also concerned that the wind farm development footprint would be located in areas of deep peat and we did not think the ES satisfactorily explained how the surplus peat would be dealt with/disposed of in such a way to avoid detrimental effects to the surrounding blanket bog vegetation and watercourses. As the blanket bog in this area has been prone to peat slides in the past, we also believed that the peat slide risk assessment and mitigation provided (during construction) did not go far enough to diminish the risk of further peat slides.

We note that the Addendum has tried to address these issues and others that have been raised by statutory and non statutory consultees. Having read the Addendum we still have **serious concerns** regarding certain aspects of the development, specifically the impact of the development footprint, the Habitat Management Plan, and the carbon payback calculations. We will deal with each of these issues as succinctly as possible below.

Development footprint

Turbines located on deep peat

The Scottish Wildlife Trust is pleased to see that development in the north east 'Laxo to Collafirth' area has been deleted from the proposed wind farm. This area contained active, intact 'blanket bog' and areas of deep peat.

However, many of the remaining turbines are still located on deep peat (i.e. > 2 m). Appendix A4.2 lists the turbine locations and related peat depth. We note that only 16 out of 123 turbines are located on peat ≤ 1 m; 37 are located in peat ≥ 2 m, 12 of these being in very deep peat i.e. ≥ 2.5 m. Such turbine sitings have obviously presented a problem, in terms of disposal of excess peat, and we note that one of the solutions to dealing with surplus peat is to store large piles of it by each of the turbine bases for 25 years:

Peat extracted from the turbine base areas will be stored on-site for re-instatement following the decommissioning of the wind farm. (Chapter A16 Air and Climate – page 12).

We are concerned that there is no detailed explanation as to how the extracted and stored peat will be protected from the 'elements' (e.g. wind and rain) or how peat oxidation will be prevented. Without mitigation, the 'piles of peat' will not remain 'intact' over the lifetime of the project. Peat erosion is a likely outcome which will cause CO_2 release and possible pollution of watercourses or adjacent blanket bog. Erosion effects are likely to be exacerbated when peat mounds are located on steep and/or exposed slopes. We urge that a management plan for dealing with

these mounds is implemented, strictly enforced and adhered to, in order to prevent negative impacts to the surrounding area.

Appendix A14.4 states that: *Every effort has been made to avoid and reduce the excavation of peat so far in the design process* (page 4).

We believe that 'efforts' should go further by moving (by micro-siting) turbines that are currently located on the deepest peat (e.g. ≥ 2.5 m - 12 in total) to areas of shallower peat. If turbine relocation is not possible, those turbines on the deepest peat should be deleted from the development footprint.

Regardless of this, a comprehensive description of how the peat 'mounds' are to be stabilised over the life time of the wind farm needs to be clearly stated and a management plan agreed before the planning application can be considered further.

The Scottish Wildlife Trust is also concerned that the carbon balance calculations in Appendix A16.6 do not account for potential CO_2 lost from the stored peat.

Access tracks

Whilst we welcome the reduction in length of access tracks, we are still concerned that some areas of the remaining track cross areas of very deep peat and/or are located on steep sided slopes.

We are pleased to see that nine peat slide risk areas no longer lie adjacent to the proposed infrastructure; however we note that **45** risk areas still remain. Therefore, our concern regarding the possibility of a peat slide event and its effects on biodiversity and local ecosystem functioning, occurring somewhere across the site, is still relevant.

Chapter A14 – Soil and Water (in terms of peat slide mitigation) states:

The requirement to highlight and appropriately deal with these matters, and to minimise the likelihood and magnitude of such events, remains as stated in the 2009 ES.

We believe the peat slide risk has not been sufficiently dealt with, nor is the mitigation (as outlined in the 2009 EIA) sufficient to prevent a peat slide occurring. We do not believe that the potential serious risk of such an event has been lowered or addressed adequately in the Addendum. Mitigation needs to **prevent** a peat slide occurring, not deal with the after affects.

The original EIA (2009) stated:

Additional ground investigation work is recommended for areas highlighted in the initial hazard ranking as at 'substantial' risk of peatslide but that were not surveyed under the first phase of ground investigation work (Dc, Dh, Nb). Investigation is also recommended for Location Db, owing to the presence of an observed instability and suggested track realignment for this location. Site-specific information in all cases would enable the peat stability assessment to be revised further to address the local situation.

We are unclear whether the track has been realigned in Location Db. Furthermore the Addendum does not make clear if the additional ground investigation work that was recommended for areas highlighted in the initial hazard ranking as at 'substantial' risk of peat slide (see 2009 EIA Chapter 14), has been undertaken (or is being undertaken).

Habitat Management Plan – Chapter A10.9

Priority habitat management: blanket bog

We welcome the inclusion of a detailed habitat management plan with the objective, *inter alia*, of: *promoting the recovery of active blanket bog over a large part of Viking study area* (Chapter A10.9).

We note that the pilot project will occur in an area *where land manager co-operation has been secured* (page 41).

It is stated (page 41) that a principal logistical constraint on management is:

Scottish Wildlife Trust Cramond House 3 Kirk Cramond Edinburgh EH4 6HZ
T 0131 312 7765 **F** 0131 312 8705 **E** enquiries@swt.org.uk **W** www.swt.org.uk

Practical and financial compatibility of habitat management work with existing land use, especially in view of the complex pattern of land ownership and occupancy associated with the long-established crofting economy, combined with recent and continuing changes in agri-environment subsidy mechanisms.

We presume this means that no other land management agreements have yet been forthcoming across the rest of the site. We believe it is essential to clarify both the sources of funding for future habitat restoration and secure land management agreements across areas ear-marked for future habitat restoration as part of the planning application.

Habitat restoration is an important component of the wind farm application in terms of mitigating the significant negative impacts of the wind farm footprint and is described as a positive measure to lock up carbon which is presently being released in areas of blanket bog habitat that are exposed and/or eroding. Successful restoration of blanket bog is part (albeit small) of the carbon payback calculations. For clarity, a map of areas identified for habitat restoration should be part of the habitat management plan.

Pilot blanket bog management area (page 42- 52)

It is stated that*: It is anticipated that blanket bog management will be undertaken in stages over a significant part of the wind farm…*

This is not the same as stating that blanket bog management will be undertaken. This point needs clarifying. Under what circumstances will blanket bog management not occur?

Methods of restoration – hydrology (page 27) *and use of peat dams*

The use of peat dams is a well recognised technique[1,2] and a low cost solution. To be successful, there are practicalities to consider such as:

- Ensuring highly humified peat is used (von Post H6-H8)
- Not using highly oxidised peat
- Used for ditches < 1 m in width
- Not suitable for steep gradients[1]

More recent research has also found that peat turves are unlikely to act as dams where: there are steep slopes (> 3^{o}); in areas of severe erosion; in very wet or very dry locations, or if the mineral substrate is exposed[2].

We would urge caution regarding the general use of peat dams in that, an expert in this field will be needed to judge where they will and will not work, as well as to assess which peat is the 'right type of peat' (e.g. will those constructing the peat dam recognise peat that is von Post H6- H8?) for the dam.

Siting of peat dams will require careful and expert supervision and it should not be seen as a way to dispose of unwanted peat into every ditch.

Downstream watercourses will have to be monitored to ensure that peat dams are not being washed away- and to check that they are preventing peatland erosion. Each dam will also require careful post (dam) construction monitoring. Of note, rewetting of the surrounding 'bog' surface can occur quickly which may make conditions unsuitable for heavy machinery.

To conclude, whilst we recognise that peat dams are a useful and cost effective method for blocking small and gently sloping drainage ditches, they are not a panacea for getting rid of unwanted peat. The work will have to be carried out by skilled individuals and post construction monitoring of the dams and downstream watercourses must be part of the management agreement.

[1] See: S. Brooks and R. Stoneman (1997) Conserving Bogs – the Management Handbook. The Stationary Office, Edinburgh.
[2] See: Armstrong et al (2009). Drain-blocking techniques on blanket peat: A framework for best practice. *Journal of Environmental Management*. 90(2009)3512–3519

Damming large erosion gullies (page 30)

We note, in the discussion of materials to use for gully blocking, that vegetative turves and peat are suggested as possible solutions. We would recommend that materials that have been successfully used in past projects (e.g. work carried out by Evans et al[3]) such as those listed in the six bullet points (page 30) should be used only.

It is stated: *In the case of gently sloping gullies, the use of natural, readily accessible materials (such as peat, stones or dislodged turfs) to form low dams may be appropriate.*

If peat is to be used, evidence that it is proven technique which is suitable for the gully conditions found on Sheltand needs to be cited.

Re-establishment of plants is considered on page 31 of the Habitat Management Plan. More clarity is needed on what techniques will be used where. Again we would emphasise the need to refer to past examples of good practice and what is likely to work (see for example Evans et al.[3]). We recommend that a number of techniques are trialled throughout the 'pilot management area (see below)' and once methods are known to bring success they can be tried at a larger scale.

Careful site monitoring will be needed to determine which methods are working as a variety of techniques will be needed across the heterogeneous site. We are concerned that wavy hair-grass (*Deschampsia flexuosa*) and bents (*Agrostis* spp.) are referred to as plants that will bind peat- if planted as seed. Probably the most important pioneering species is *Eriophorum angustifolium* which can, in certain circumstances, naturally regenerate. If the grass species are employed as stated above, evidence of their successful colonisation elsewhere, in a similar setting should be cited. Grass seeds on their own are unlikely to establish as the conditions on bare peat can be very hostile (e.g. in terms of microclimate, and chemical properties). As stated, coir mesh may be necessary to 'stabilise' the peat.

Post construction monitoring will be a key part of the re-vegetation strategy.

Pilot blanket bog management area (A10.9 page 42)

It is stated that (page 52): *it will be necessary to make repeat assessments, perhaps at intervals of five years, of the surface condition of the peatland*.

We believe it will be necessary to 'ground truth' the site (by possibly using permanent quadrats) on a more regular basis than every five years. Blocked drains and gullies will need to be checked on a regular basis- more so, if peat dams have been used. Water quality monitoring, downstream, should also be used to assess the level of peat erosion still occurring.

The management plan must be flexible enough to allow for changing practices if one method has not worked. Indeed we recommend that, from the outset, methods are tried on a small scale. Those that have achieved the desired outcomes (in terms of blanket bog restoration, decreased erosion and pollution and, increased biodiversity) should be trialled on a larger scale ensuring that the methodology is matched to the location.

We are concerned that resources for the long term objectives of the habitat management plan have not been assured, and before the planning application is processed, it must be clearly stated how the restoration programme will be funded over the 25 year period.

To conclude, we believe the restoration of the degraded blanket bog could achieve the desired outcomes of increasing biodiversity and restoring ecosystem services. However, we do not believe the present management plan is there yet. To set the benchmark of how to restore degraded peatland (of this type), it will require the commitment of skilled professionals working together over the life time of the project. A flexible approach will be needed, and the site will need to be monitored on a regular basis to ascertain what has been successful and what has not.

We recommend that a working group is established (composed of the appropriate statutory agencies, experts in peatland restoration, landowners, environmental organisations and other stakeholders) to steer

[3] Martin Evans, Tim Allott, Joseph Holden, Catherine Flitcroft & Aletta Bonn (2005) Understanding Gully Blocking in Deep Peat. Moors for the Future Report No 4.

Scottish Wildlife Trust Cramond House 3 Kirk Cramond Edinburgh EH4 6HZ
T 0131 312 7765 **F** 0131 312 8705 **E** enquiries@swt.org.uk **W** www.swt.org.uk

the project forward. Above all, the project must be adequately resourced and have the cooperation of the landowners and tenants over its life time to have any chance of success.

The above recommendations are compatible with Scottish Renewables Good Practice Principles[4]:

Principle 2: *Where development is proposed for peatland, good practice should be followed and steps taken to deliver positive greenhouse gas and other environmental benefits, consistent with the natural ecosystem functions of the habitat. This should be achieved through agreements to ensure properly planned and managed habitat restoration with steps taken to ensure maximum effectiveness, developed through full and open stakeholder engagement.*

Principle 3: *The renewables industry will assist in improving the knowledge base on the impacts of development on peatland and the effectiveness of peatland rehabilitation through putting in place scientific monitoring and sharing of data with other stakeholders, where appropriate.*

Principle 4: *The renewables industry will engage with stakeholders to provide support for applied research into key areas of peatland science relevant to understanding the impacts of development on the various peatland qualities including biodiversity, carbon and hydrology.*

Carbon payback calculations (Chapter A16 Air and Climate and A16.6)

In the explanation of the calculations (page 3) it states:

Whilst it has been claimed that drainage distances can be up to 200 m, evaluation of peat in Scotland indicates that distances of between 0 and 21.3 m would be expected. In light of this evaluation the calculation has been re-run for three drainage distance scenarios: 10 m, 20 m, and 50 m. The 50 m drainage scenario has been selected as the worst case based on the available evidence, rather than the 100 m distance in the 2009 ES.

It is also stated that (page 13): *The extent of drainage effects on peat is a critical parameter in assessing the disturbance to peat and hence carbon emissions.*

The report gives drying distances of 10 m, 20 m and 50 m. The use of these distances in the calculations requires more careful explanation that that which is given. Nowhere is the topography of the drainage site considered which is a serious omission since the effects on drainage, down slope, on a steep sided slope have been shown to be much greater than those on level ground. Indeed, a recent study by Holden (2005)[5] has demonstrated that drainage effects can be caused over distances of 400 m. Therefore the 'conservative' drying distance of 50 m should not be the upper limit. We recommend the calculations are revised to account for the variable topography of the site.

Although it is stated (page 12) that:

It is not, therefore, considered that this peat is lost and as such the removed peat from the turbine bases has not been included in the calculation for peat loss. Peat extracted from the turbine base areas will be stored on-site for re-instatement following the decommissioning of the wind farm.

there is no explanation as to how the stored piles of peat will be prevented from either eroding and/ or oxidizing. To be conservative, the excavated peat from the turbine bases should have been included in the calculations.

Conclusions

The Scottish Wildlife Trust still has <u>serious concerns</u> regarding the proposed wind farm application submitted by VEP. The wind farm is sited in some areas of very deep peat, which is problematic in terms of peat disposal and potential pollution risks. Some of the access tracks are located in deep peat on steep sided slopes, which increases the peat slide risk. Furthermore, the heterogeneity in topography across the site, not been adequately accounted for in the carbon payback calculations (e.g. in terms of estimating

[4] Scottish Renewables Publication (2010) Wind farms and peatlands: Good practice principles.
[5] Holden, J. 2005. Peatland hydrology and carbon cycling: why small-scale process matters. Philosophical Transactions of the Royal Society, Series A, 363, 2891-2913

'drying distances'). Whilst we acknowledge that the Habitat Management Plan is much improved, its implementation will require the commitment of skilled professionals working together over the life time of the project. Above all, the project must be adequately resourced and have the cooperation of the landowners and tenants over its life time to have any chance of success.

We remain to be convinced that all procedures that need to be put in place, to guarantee success, will be put in place and we recommend that a working group oversees the peatland restoration project from construction to the decommissioning of the wind farm.

Yours sincerely,

Dr. Maggie Keegan
National Planning Co-ordinator
The Scottish Wildlife Trust

Scottish Wildlife Trust Cramond House 3 Kirk Cramond Edinburgh EH4 6HZ
T 0131 312 7765 **F** 0131 312 8705 **E** enquiries@swt.org.uk **W** www.swt.org.uk