



SHETLAND AMENITY TRUST

REPRESENTATIONS ON THE SECTION 36 APPLICATION FOR THE PROPOSED VIKING WIND FARM IN SHETLAND

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**SHETLAND AMENITY TRUST'S REPRESENTATIONS
ON THE SECTION 36 APPLICATION FOR THE
PROPOSED VIKING WIND FARM IN SHETLAND**

INTRODUCTION

Here are the detailed representations of Shetland Amenity Trust in relation to the proposed Viking Wind Farm in Shetland and in response to the Environmental Statement supplied to the Trust.

Shetland Amenity Trust was established 26 years ago, employs 138 people and has an annual turnover of just over £4.2 million of which just under £350,000 was project funding from National and European agencies (based on 2008/09 figures). It is an environmental body whose aims are to safeguard and promote access to Shetland's natural and cultural heritage. In particular, we have a keen interest in Shetland's landscape, archaeology, natural heritage, cultural heritage, native trees and the use of renewable energies. The objectives of the Trust as set out in the Trust Deed are as follows:

- (a) The protection, improvement and enhancement of buildings and artefacts of architectural, historical, educational or other interest in Shetland with a view to securing public access to such buildings and the permanent display for the benefit of the public of such artefacts for the purposes of research, study or recreation.
- (b) The provision, development and improvement of facilities for the enjoyment by the public of the Shetland countryside and its flora and fauna, the conservation and enhancement for the benefit of the public of its natural beauty and amenity and the securing of public access to the Shetland countryside for the purposes of research, study or recreation.
- (c) Such other purpose or purposes charitable in law as the Trustees shall from time to time determine.

Executive Summary of Shetland Amenity Trust's Representations

1. Shetland Amenity Trust fully supports the principle of utilising renewable energy and the development and implementation of renewable energy developments in Shetland which are appropriate in terms of location, scale and cost and are for the benefit of the community.
2. Shetland Amenity Trust is committed to carbon reduction initiatives to reduce Shetland's carbon footprint.

3. Having fully considered the Environmental Statement in connection with Shetland Amenity Trust's objectives and remit, and having taken the detailed advice and expertise of the Trust's relevant professional officers into account, we object to the Viking Energy application on the following grounds:
- a) That the Shetland landscape is of international importance and deserves to be protected under the European Landscape Convention by virtue of its unspoilt character and the Viking Wind Farm proposals would have too great an adverse impact on that internationally important landscape.
 - b) Within the boundary of the proposed wind farm lie some of the most isolated places in Shetland. As a result of a lack of disturbance a diverse breeding bird community has flourished among areas of active blanket bog. Here one can walk for a day without seeing another soul amidst a very special landscape occupied by a unique assemblage of wildlife. To penetrate such areas with infrastructure and associated roads will damage this landscape, take away this feeling of wilderness forever and could dramatically increase the levels of disturbance on breeding bird populations.
 - c) The Environmental Statement contains insufficient information in a number of areas for the impacts of the proposal to be assessed properly. A summary of some of these are highlighted below as a series of bullet points with more detailed discussion under the relevant headings:-
 - Many assumptions are made in calculating the carbon payback time in the Environmental Statement. We therefore have little confidence in the predicted figures for best, intermediate and worst case scenarios. Indeed we believe there has been no proper assessment of a worst case scenario for this development. Using the model used in the Environmental Statement, a buffer of 200m and assuming the possibility that the hydrology will not be restored gives a worst case scenario for carbon payback of 601.5 years.
 - Since the Viking Energy project is predicated on the construction of a converter station and interconnector cable, we feel that the carbon emissions released in the construction of these should be included in the assessment of the carbon payback period of the Viking Energy project as a whole. Looking at them in isolation is artificial and misleading.
 - The Habitat Management Plan (and notably restoration of site hydrology) is key to mitigating many of the adverse environmental effects identified within the Environmental Statement. Yet this plan contains many novel and unproven techniques that we feel are unlikely to be effective in Shetland.

Indeed by Viking Energy's own admission many of these will require trials before they can be applied. These trials themselves may take years to complete.

- The European Landscape Convention entered into force in the UK on 1st March, 2007 and recognises the importance of landscapes and imposes important obligations on signatories to introduce policies for their protection. The Environmental Statement makes no reference to this Convention.
- We are concerned that insufficient importance is attached to the breeding populations of some species of bird within the wind farm area when assessing its impacts on these species. Some of these are present in nationally important numbers, yet it appears that only Merlin, Red-throated Diver and Whimbrel have any real importance attached to them in the Environmental Statement.
- There is no comment on the densities of breeding birds within the wind farm area (or indeed the breeding bird assemblage) in the Environmental Statement. These should be compared with those on mainland Scotland to enable a proper assessment as to whether site selection is appropriate.
- A thorough appraisal of the density of key breeding species within the wind farm area against other sites designated for these species in Shetland needs to be made. The area within the wind farm may not be classified as a Special Protection Area but from a nature conservation (rather than a political) perspective it is important to determine its relative importance for these key species.
- A thorough survey of lower plants needs to be undertaken in the wind farm area by a recognised expert bryologist. A nationally scarce peat forming species of Sphagnum has recently been found within the site, while the surveys undertaken by Viking Energy's consultants (which only covered a small part of the site) claim to have located 3 species new to Shetland, although they did not appear to recognise this.
- It appears that no field survey of terrestrial invertebrates has been undertaken. This is surely an oversight especially as the scoping opinion stated that baseline survey of the significant invertebrates on the site should be carried out. Existing data are too limited to be confident that no significant invertebrates are present.
- Active blanket bog, which occurs in significant areas within the wind farm boundary, is listed as a priority habitat on Annex 1 of the EC Habitats

Directive and this habitat is therefore of international importance. It is also a priority habitat in the UK BAP. We believe that the area of blanket bog that may be impacted upon by the development has been significantly underestimated.

- The quality of the blanket bog within the wind farm boundary has not been assessed against other blanket bog areas in Shetland to establish its relative importance in a Shetland, national and international context. Although it is not currently classified as a Special Area of Conservation this does not mean that it is of lower quality than sites in Shetland that currently do hold this label. This needs to be established prior to development.
- The distance between the transects of the walk over archaeological survey should have been 5-10m for adequate coverage.
- No sub-surface archaeological evaluation has been carried out.
- Mitigation for archaeology is inadequate.
- The impact assessment on cultural heritage is based almost entirely on the siting of the turbines themselves, neglecting the equally large effect that the building of 70 miles of roads and the opening of quarries would have.
- There is inherent imbalance in the assessment of cultural heritage, that is biased heavily towards Listed Buildings and Ancient Monuments, but pays little regard to the cultural usage of the moorlands as a whole. This is consequent to defective analysis, where the perceived cultural usage of moorlands comprises only the built heritage.
- Research methodology has been inadequately carried out, beyond scrutinising building remains. Little or incompetent use has been made of historical sources, maps, unpublished and traditional accounts, or artefact find-spots. Using all these sources would fully elucidate the cultural usage of the moorland in the historic era, partly from generic practises carried out generally, but no such research has been undertaken. Such deficiencies seriously undermine the validity of the findings.
- Important post-medieval cultural sites that would be adversely affected by the development are not mentioned, primarily relating to subsistence farming. Partly this stems from incomplete research, and to propose vast industrial development in areas where there are little-studied sites that have important cultural significance is reckless.

- Visitor experience of cultural sites would be adversely affected by the imposition of an industrial landscape. This relates both to visual amenity of the islands as a whole – especially bearing in mind the importance of the tourist economy – and to appreciation of the moorlands in their own right. The Cultural Heritage report dwells only on turbines, not quarries and roads. Such partial methodology is misleading at best.
- The Environmental Statement is lacking in many important details when trying to determine the impacts on the environment, cultural and archaeological heritage. The lack of precise locations of concrete batching compounds and proposals on water abstraction are but just two examples of this.

RENEWABLE ENERGY

Shetland Amenity Trust supports the concept of renewable energy developments in Shetland which are appropriate in terms of scale, location, cost and community utility. The Trust has been reviewing the potential to utilise renewable energy within its own properties resulting in a number of options being actively pursued including small-scale wind turbines, a micro-generation hydro scheme and an exhaust heat recovery system. In addition, the Trust actively promotes the concept of renewable energy through its educational activities through its work within schools.

To complement our pro-active work in this area, the Trust was awarded a grant from the Scottish Governments Climate Challenge Fund to develop a two year Carbon Reduction initiative for Shetland which involves working very closely with all sections of our community to reduce our collective carbon emissions by 28,000 tonnes over two years.

At present, the UK has 207 onshore and 9 offshore wind farms producing 3,625 MW. In addition to this there are further 35 onshore and 10 offshore wind farms under construction, giving a further 2,654 MW of power.

Throughout the UK, there are an additional 125 onshore and 8 offshore wind farms with planning consent giving a further 6,180 MW.

UK Producing Wind Farms/Under Construction/Consented Projects (data source - British Wind Energy Association)

We believe that there are a number of alternative renewable energy options (including offshore wind farms, tidal, micro-hydro electric, photo voltaic, etc.) which could and should have been properly considered in a combined and integrated fashion to meet the energy needs of the Shetland community, as an alternative to the Viking Energy proposal.

Location	Number of Wind Farms	Production (MW)	% of Production	Average Production per Wind Farm (MW)
Onshore	367	7006	56.2	19.1
Offshore	27	5452	43.8	201.9

The offshore sector is (or will be) producing 43.8% of total energy output from just 6.9% of actual UK wind farms, demonstrating a high efficiency rate compared with onshore. Technology for offshore wind farms is well developed and reliable. It is disappointing that the Viking Energy Environmental Statement dismisses the offshore wind farm option in less than a single sentence, particularly given its clear UK potential. We are also aware that our near neighbours in Norway are now actively investing in offshore wind farms instead of onshore.

CARBON PAYBACK

The release of greenhouse gases, in particular CO₂, is the main cause of climate change. Wind farms constructed on blanket bog (peat) need to be examined very closely in terms of carbon payback. Drainage and other damage to the peat surface results in desiccation of peat which releases significant stores of carbon into the atmosphere where it directly contributes to climate change. Nayak *et al* (2008) state that if good management techniques are not practised, and site selection is inappropriate, carbon emissions from dehydrated peat increase to over 100% of emissions savings, and there is a net carbon cost associated with the wind farm.

The overall impact of the Viking Wind Farm should be determined by calculating the payback period required to offset any carbon emissions that arise from the construction and operation of this project. The life expectancy of the project is 25 years. Viking Energy's own document suggests that (Vol 2: 16-12):

- A payback period of 0-10 years is beneficial
- A payback period of 10-25 years is neutral
- A payback period in excess of 25 years is adverse

They have published figures for three scenarios – what they term as best case, intermediate case and worst case. In their Written Statement they present figures of 2.3 years, 3.7 years and 14.9 years respectively for the three scenarios (Vol 2: 16-19). Yet in their summary of mitigation measures these figures are 2.8 years, 6.8 years and 48.5 years (Vol 2: 20-9). There is no indication as to why two sets of figures are presented, or indeed, which represents the most likely outcome.

They then argue that an intermediate case scenario would be appropriate when considering carbon payback period for the Viking Energy wind farm. We question, however, whether their application of the carbon payback model (Nayak *et al* 2008) is appropriate for determining carbon payback times for the Viking Energy wind farm. It is also arguable whether they have presented figures for a genuine worst case scenario. Consider the following points:

It is recognised by some peatland ecologists that a 200m or even a 250m buffer should be used when determining the impacts of roads, compounds, etc. on the hydrology of blanket bogs. Indeed Viking Energy acknowledge this in their own submission '*Studies have shown that drainage can be affected by as much as 200m from the ditch*'. Yet despite this they use a figure of 100m for their worse case scenario (Vol 2: 16-8).

Viking Energy argue that the majority of roads (74%) will be floating roads as these '*are designed to 'float' on top of the peat so no peat is excavated for the road construction*' and are '*also designed to have no associated drainage in order to*

minimise the impact on the peat (Vol 2: 16-10). There is no published information to support these assertions – floating roads will sink, will compact and damage the peat underlying them and will almost certainly require drainage throughout their length. Whilst Viking Energy do go on to acknowledge (Vol 2: 16-10) that it is likely some floating roads will in fact sink and some will require drainage, their proposed worse case scenario is highly likely to apply here.

The authors of the equation/model (Nayak *et al*) used in the Environmental Statement to calculate payback times stress the importance of restoration, specifically in restoring the water table to reduce desiccation of the peat. This is echoed in the Statement itself (Vol 2: 16-11) *...As mentioned above, restoration of the site is essential for minimising carbon losses. The calculation assumes that if the hydrology and habitats on site are restored, carbon losses occur for the lifetime of the wind farm only. However, if the hydrology and habitats on site are not restored, the default assumption in the calculation is that carbon losses are 100%.... The calculation has been undertaken assuming that the hydrology and habitats on site will be restored upon decommissioning. Therefore, the results presented in the assessment assume that carbon losses are for the duration of the wind farm lifetime only. It is imperative that the hydrology of the site is restored upon decommissioning to prevent substantial losses of stored carbon.* Restoration of site hydrology is clearly the critical component in determining carbon payback, yet the model allows for just two scenarios: total restoration or no restoration. Both of these are highly unlikely. It would be more realistic to acknowledge that hydrology will not be restored on some parts of the site and, indeed, that in some parts of the site hydrology will not be impacted upon in the first place. This area clearly needs more work before a carbon payback period can be determined with any confidence.

Values inputted into the calculations assume that site hydrology and habitats will be restored in best, intermediate and worst case scenarios. The spreadsheet authors (Nayak *et al* 2008) clearly state that this option should only be used if the site restoration plan demonstrates a *high probability that peat hydrology will be restored across the site*, and that *the restoration plan for a site requires expert input and site specific strategies*. However, the Habitat Management Plan admits...*Some of the techniques described in this section are relatively novel and totally unproven in the Shetland environment* (Volume 4a Appendices Part 1, Chapter 10.9, section 4.8), and goes on to say *This applies especially to the methods proposed for stabilising and revegetating bare peat surfaces... For these techniques in particular, trials are needed in order to determine the most satisfactory techniques across the Viking area as a whole and potentially for other degraded sites in Shetland.*

There is, in fact, no evidence that the restoration work proposed will restore the hydrology. It is widely accepted by peatland ecologists that blanket bog habitats are typically not restored but that 'new' habitats are created. Comments from the Environmental Statement highlighted above and below do not seem to suggest a

high probability that restoration will be successful. Surely, therefore, a worst case scenario should assume that the hydrology of the site will not be restored successfully and that carbon losses will extend beyond the life of the project and could actually be 100%.

Input values for the payback calculation assume the water table will be restored to the exact depth of predevelopment levels, for best, intermediate and worst case scenarios (Volume 4a – Appendices Part 3, Chapter 16.1). However the Environmental Statement also states that no data on site water table depth is available. *No detailed information on the water table depth was available for use in this Assessment* (Vol 2: 16-9).

The Environmental Statement suggests that there will be no landslips during the construction phase or life of the project (Vol 2: 16-10) and thus in their assessment of the best, intermediate and worst case scenarios Viking Energy assume no landslips. We consider, however, that it would be appropriate to consider landslips when predicting a worst case scenario.

Much of the other information in Viking Energy's carbon payback equations relies heavily on assumption and assertion for which there is little published information. Perhaps most telling are three of Viking Energy's statements in the section on the carbon payback period.

'The calculation assumes that the hydrology of the site will be restored upon decommissioning and so reported CO2 losses are for the duration of the wind farm lifetime only. If the hydrology of the site is not restored, the CO2 losses would be substantially greater' (Vol 2: 16-17)

'The results should be viewed as an indication of the potential effects should all the input parameters be correct. In the event that the input data and assumptions are incorrect, it should be appreciated that the results could be significantly different' (Vol 2: 16-13)

'Due to the assumptions used to calculate the payback period, and the nature of the assessment, the results should be regarded as indicative, rather than a definitive prediction of the actual payback period which would occur in practice. The results assume that the hydrology of the site is restored upon decommissioning which is the critical component for determining the payback period of the wind farm' (Vol 2: 16-19)

Such statements do not inspire confidence in the data presented and conclusions drawn in terms of carbon payback periods?

One final but important point to consider is that the interconnector and the substations (converter stations) are not included in the carbon audit. Both are totally dependent on the wind farm and will be there to serve the wind farm. Surely the carbon payback times to generate the materials for these, and their construction, etc. should be included in any debate on whether the Viking Wind Farm will or will not be 'green'. The exploitation of a legal loophole whereby each planning application can be considered individually is not a way to conduct business when a key factor of the 'wind farm debate' is whether or not the whole project will bring real environmental benefits through reducing carbon emissions.

In conclusion, we have real concerns as to whether this project, taken in its totality, will at best prove to be carbon neutral and at worst that it will actually contribute to global warming. We have little confidence that the application of the model as used in calculating the carbon payback times for the Viking Energy wind farm is appropriate. Due to a lack of hard site specific data, many assumptions have been made in determining payback times. The critical components of the model appear to us to be, the extent of the peat buffer zone and the impacts upon, and subsequent restoration, of site hydrology. Figures used for both of these are little more than guesswork. If a buffer of 200m is used, as recommended by some peatland ecologists, and hydrology is not restored the model predicts a carbon payback time of 601.5 years. The model gives only 2 possibilities for restoration of site hydrology: 100% restored or 0% restored. The actual answer will lie somewhere between the two.

LANDSCAPE

One of Shetland's key natural resources and assets is its unspoilt landscape. Over 77% of all visitors to Shetland come for a natural and cultural heritage reason and one of the main drivers is to discover and appreciate the peace and quiet of this unspoilt landscape concomitant with its rich biodiversity of flora and fauna. Indeed, the special unspoilt quality of Shetland has been specifically and independently recognised by a panel of 552 experts commissioned by the National Geographic in 2006 to identify the world's most unspoilt islands. They assessed 111 selected islands and Shetland came out third-equal with Lofoten in Norway and Chiloé in Chile, just behind Faroe and the Azores. The panellists described Shetland as follows:

"These islands have got everything 'with bells on': spectacular sea cliffs; pristine beaches; fascinating geology; over a million breeding seabirds; the highest density of otters in Europe; regular sightings of killer whales; and superb displays of rare sub-Arctic flora."

"A unique blend of Scotland and Nordic culture. Somewhat remote, the Shetlands have protected the environment and continue to attract tourists and maintain other sectors (fishing and oil) in harmony."

"Location, climate, and access keep tourism numbers down. Extremely high integrity in all aspects of heritage and ecology, despite oil developments. Great planning controls and attitude."

"There is great pride amongst locals in the islands and in the welcome they extend. Shetland Wildlife Trust, a major conservation group, organizes wildlife holidays."

www.nationalgeographic.com/traveler/features/islandsrated0711/islands.html

Shetland has a demonstrable track record in caring for its environment and minimising the adverse visual and environmental impacts of large-scale industrial developments. Rigorous planning controls and environmental policies were utilised in the early 1970s to physically contain and minimise the visual and environmental impacts of Europe's largest oil terminal at Sullom Voe, so that it blends and fits into the landscape and is not an eyesore. Given this track record and Shetland's independently recognised special 'unspoilt character', it is all the more important that this approach is applied now and into the future in face of increasing pressure and demands on Shetland's resources, including its unspoilt and undeveloped landscape.

Having carefully studied Viking Energy's Environmental Statement it is immediately apparent that there is no mention of the European Landscape Convention or any

evidence that its terms have been considered and taken into account in preparing the Statement. This is both alarming and telling.

The European Landscape Convention entered into force in the UK on 1st March, 2007 and recognises the importance of landscapes and imposes important obligations on signatories to introduce policies for their protection. The Explanatory Report on the Convention states that

“(Europe’s populations) have come to realise that the quality and diversity of many landscapes are deteriorating as a result of a wide variety of factors and that this is having an adverse effect on the quality of their everyday lives.

Landscape must become a mainstream political concern, since it plays an important role in the well-being of Europeans who are no longer prepared to tolerate the alteration of their surroundings by technical and economic developments in which they have had no say. Landscape is the concern of all and lends itself to democratic treatment, particularly at local and regional level.

The general purpose of the Convention is to encourage public authorities to adopt policies and measures at local, regional, national and international level for protecting, managing and planning landscapes throughout Europe so as to maintain and improve landscape quality and bring the public, institutions and local and regional authorities to recognise the value and importance of landscape and to take part in related public decisions.

In addition to their local significance, Europe’s landscapes are of value in various ways to all Europeans. They are cherished outside the locality and beyond national borders.....

In their diversity and quality, the cultural and natural values linked to European landscapes are part of Europe’s common heritage, and so European countries have a duty to make collective provisions for the protection, management and planning of these values.”

paras 21, 23, 25, 29 & 30 of the Explanatory Report on the European Landscape Convention

What is being proposed by Viking Energy constitutes one of the largest wind farm developments in Europe and is on a vast and industrial scale relative to Shetland. 150 extremely large turbines and their associated infrastructure are proposed to be sited on the highest ground within the heartland of Shetland’s landscape. This landscape could be viewed as inhospitable and inaccessible and of little value but it is this very inhospitability and inaccessibility that has hitherto inhibited development

and guaranteed its unspoilt and truly wild nature which is regarded by many as one of Shetland's most precious assets. Because Shetland is virtually tree-less, has a clean atmosphere and a wide open landscape where you can see 50 miles on a clear day, any industrial wind farm placed in the middle of the islands would be visible on a clear day (and we have many of them) from all over the islands and especially from the sea, which is where most visitors to Shetland arrive from. The structures will dominate the horizon and the movement of the turning blades will dominate the attention of all observers.

The development is likely to have a significant adverse impact on Shetland's reputation as one of the world's most unspoilt islands and the works associated with it will have an irreversible impact on the landscape and the environment. This in turn is likely to trigger an adverse reaction from potential visitors to Shetland with a concomitant negative impact on Shetland's tourism industry. We know from independent surveys what the main triggers/reasons are for visitors choosing to come to Shetland, despite the barriers of high travel costs. As already stated, the main reason/trigger is Shetland's Natural and Cultural Heritage (77%) and that the top 3 (37%) are:

1. Birds/Wildlife/Nature/Flora 17%
2. Scenery/Landscape 10%
3. Peace and Quiet, Remoteness 10%

37% (source: Shetland Visitor Survey 2005/06)

It is important to note that Europa Nostra, the voluntary organisation charged with safeguarding Europe's natural and cultural heritage, and which advises the Council of Europe, is becoming increasingly concerned about the impact of wind turbines on the countryside. Europa Nostra has issued a Declaration in 2004 on wind turbines and the following paragraphs of this Declaration are particularly relevant to the consideration of the Viking Energy Wind Farm:

“

7. *Whilst the Council fully supported the drive for renewables, including wind-power, it considered that wind-turbines must be sited in appropriate places.*
8. *The Council also considered that many countries have so far tended to focus too heavily on wind-power, whether on or off shore. They have provided heavy incentives for its development, relaxed planning legislation, and failed to make a balanced assessment of its merits and demerits, with the consequence that vast areas of beautiful landscape throughout Europe are now dominated by groups of ever larger wind-turbines – every one which constitutes a small power station – and are*

thus being effectively industrialised, with consequent serious damage to the natural heritage.

9. The Council held that, in many European countries, a situation is being created in which social, economic, tourism, historical, cultural, wildlife and landscape impacts are being insufficiently addressed in the decision making process relating to wind-power.

10. Against this background the Council took the view that, in relation to on-shore wind-turbines, or groups of wind-turbines, the decision making process of public authorities should include wide consultation; should be based on an understanding of the significance of local landscape character and values; and should for any project always take into account the following considerations:

- a. The impact on the local community*
- b. The results of a careful and objective analysis of the claims made by the developer, with regard to the saving of greenhouse gases.*
- c. The degree of visual intrusion, relating this to the character and quality of the surroundings, bearing in mind that modern wind-turbines are eye-catching because they are very large (over 100 metres high and growing), usually prominently placed.*
- d. The supplementary damage to the landscape, sensitive habitats, water courses, and other aspects of the environment, caused by the construction process, including the provision of access roads, additions to electricity networks, pylons, and buildings necessary for electricity generation and transmission.*
- e. The degree to which restoration of the site to its original condition at the end of the working life of the wind-turbines can be guaranteed.*
- f. The impact on, and proximity to, sites designated internationally, nationally, regionally or locally as protected areas.*
- g. The impact on communities in the vicinity of wind-turbines, of noise and infra-sound nuisance, light interception, and/or reduction of property values.*
- h. An assessment of the need for back-up capacity when the wind-turbines are inactive (i.e. for much of the time), which will usually*

be gas, thus affecting the claimed benefits of the project in terms of greenhouse gas production and real production costs.

- i. The need to be “repowering” (i.e. replacing existing wind-turbines with larger ones) on the same basis as the original project.”*

Europa Nostra Newsletter Winter 2004-2005, p.p. 4-5

Given the international importance of Shetland’s unspoilt landscape; the undoubted adverse and very long-term impact of the Viking Energy Wind Farm on that landscape; the clear obligation to protect Shetland’s special landscape under the European Landscape Convention and other international agreements and the growing concern of bodies such as Europa Nostra in relation to large scale onshore wind farms, it is respectfully submitted that the proposed Viking Wind Farm is inconsistent with the aims of the Trust, the European Landscape Convention and Shetland’s long-term wellbeing and should not be allowed to proceed, since the cost in terms of the landscape, environmental and tourism impacts, is too great.

NATURAL HERITAGE

Avian Ecology

Species of Concern - In assessing the impacts on breeding bird species Viking Energy seem to have ignored any bird species that are not afforded special protection i.e. Merlin, Red-throated Diver and Whimbrel. Yet other species present on the site in nationally important numbers (e.g. Golden Plover, Dunlin, Arctic and Great Skua) are likely to be impacted, while some species such as Snipe (of which almost 1% of the UK population breeds on the site) seem to have been ignored completely.

Direct impacts through collision – Viking Energy’s own collision mortality figures estimate that the total kill of birds during the 25 year lifespan of the project will be 5,700 birds including e.g. 152 Red-throated Divers, 1,562 Golden Plovers, 1,460 Curlew, 335 Dunlin, 262 Whimbrel and 252 Arctic Skuas (Vol 2: 11.10.8 & Vol 4a, part 2: 11.2). It is interesting to note that for the Lewis wind farm a collision avoidance rate of 95% was used to determine collision rates, yet in Shetland a figure of 98% has been used. Despite the higher avoidance rate figure the predicted losses in Shetland are higher than those predicted for the Lewis wind farm. The effects of fog on collision risk do not appear to have been considered. Although this may be a very difficult factor to include in modelling, Shetland is particularly prone to bouts of fog during the bird breeding season (April-July). Losses of birds through indirect impacts such as habitat loss or change and disturbance are more difficult to predict. Viking Energy state that the impacts of wind farm activities on all bird species other than Whimbrel will not be significant. The level of direct and indirect losses identified however, is likely to impact on breeding populations at a regional (i.e. Shetland) and possibly national level for some species.

Declining populations – Viking Energy and some of their supporters seem to suggest that all relevant bird populations are in decline anyway and that the potential in parts of the wind farm are therefore in some way diminished. Data from the Shetland breeding bird survey does not bear this out. Whimbrel and Arctic Skuas are certainly in decline and there is some evidence that Golden Plovers are too, but there is no evidence of a decline in Curlew, Lapwing or Dunlin in Shetland. It could equally be argued that if species are in decline then the impacts of the wind farm should be considered as even more alarming as they are likely to accelerate such declines.

Density - Bird surveyors that visit Shetland are always surprised at the high density of breeding waders on our moorlands. They are certainly high in comparison with most of mainland Scotland. Indeed, considering the methodology used by Viking Energy it seems likely that totals for some species breeding on the site (and therefore densities) are under-estimates. Yet they have failed to give any comparative data on this subject which is surely an important consideration when

identifying the locations of major wind farms in a Scottish context. Furthermore, they have failed to identify that Shetland itself has a unique community of moorland breeding birds within a Scottish and British context.

Lack of designation (SSSI, SPA) for ornithological interest. - The lack of designations seems to be a major factor in the location of the wind farm. It is clear, however, that some of the Viking area qualifies for site designation on account of the population of Red-throated Divers and Whimbrel that breed within it. That the sites are not designated is more a reflection of the lack of survey data at the time and the contemporary political climate. It could be argued that Viking should have presented information on densities of these key species against those in designated sites to present a clearer picture to the reader and decision makers. It is possible that the density of Red-throated Divers and Whimbrel on this site exceed some of those on sites that were designated for these species. Without this kind of analysis there is a clear danger here that decisions are made based more on political expedience than the genuine interests of nature conservation.

The Habitat Management Plan suggests that the wind farm will benefit bird species. Yet many of the suggested management measures contained within it are unrealistic, or unlikely to succeed. What is clear is that any proposed management will not outweigh the negative effects of the construction and operation of the wind farm.

Non-Avian Ecology

We have not had time to analyse this section in detail but there are some issues that concern us. Issues regarding blanket bog are detailed below.

There were no field surveys of terrestrial invertebrates. All material is based on a desk exercise. Surely this was an oversight with a project of this magnitude, especially as the scoping opinion stated that baseline survey of the significant invertebrates on the site should be undertaken.

We are assured that highly qualified expert personnel were involved in all survey work. Yet, rather alarmingly Viking Energy's Environmental Statement states that no rare or otherwise notable plant species were recorded during the survey. Yet of the 91 flowering plants and 84 bryophyte species recorded, SIX would be new to Shetland. Any new county record is surely notable! It seems probable that surveyors were unaware of the Shetland flora, which suggests a lack of preparation; or, that some of these were errors, which may also be a cause of concern.

Sphagnum austinii was found near Maa Water during a brief walk over of that area of the site in May (A.G. Payne pers.com). This is a nationally scarce species indicative of active blanket bog and its presence suggests that other interesting Sphagna and

liverworts are likely to be present. It appears that a thorough bryological survey of the site is required, prior to developments.

Peatland/Blanket Bog

Survey area - In identifying areas to be surveyed in detail it looks as if Viking Energy should have covered a much larger area. Peatland ecologists argue that the impacts of roads, compounds, etc. can result in changing the hydrology of the blanket bog as much as 200m to 250m away. Yet Viking Energy have used a far smaller buffer zone than this, just 100m. Thus they have not undertaken detailed peatland survey work over at least 50% of the habitat that could be impacted by the development, including important areas of active blanket bog.

Importance of blanket bog - Active blanket bog (i.e. bog supporting a significant area of peat-forming vegetation) is listed as a priority habitat on Annex 1 of the EC Habitats Directive and therefore the habitat is of international importance. Blanket bog is also a priority habitat in the UK BAP. This is acknowledged in the Environmental Statement but then Viking Energy use a rather circular argument to suggest that the active blanket bog in the site is of lesser value than elsewhere in Shetland. This argument is based on the fact that if it was high quality then it would already be designated as a Special Area of Conservation. This shows a lack of knowledge of the designation process implemented by Scottish Natural Heritage. Faced with time constraints and restricted resources Scottish Natural Heritage was not in a position to undertake a full survey of blanket bogs in Shetland and then analyse the findings to identify the 'best' areas. This would, of course, have been the ideal way to undertake the selection process. Without a proper survey Viking Energy cannot make such assertions. A full survey should be a pre-requisite prior to the project being undertaken to assess its value. It is perhaps worth considering whether the Scottish Ministers will be fulfilling their obligations under Article 10 of the Habitats Directive if they determine the planning application on the basis of the current Environmental Statement.

Hydrological survey – Viking Energy seem to show a lack of appreciation that catchment methods do not necessarily apply when considering hydrology on blanket mire - macrotope boundaries can be quite different. Catchments are determined purely on the basis of watersheds and are in essence a drainage basin of a river system. A macrotope results from the accumulation of linked mesotope (blanket bog) units some of which will lie across watershed units. Hydrological disruption to one mesotope can lead to damage to another and another and so on. Viking Energy should have looked at the entire functioning system of each macrotope and the blanket mire as a whole not just considered a series of catchments.

Habitat restoration – Viking Energy's mitigation strategy relies significantly on habitat restoration yet some peatland ecologists argue that it is very difficult to

restore blanket bog to the state that it was in before it was impacted upon. Instead, more typically, a new habitat is created that may not function in the same way. Many of their ideas for habitat management and restoration are unproven in a Shetland environment, will take too long to test in terms of the timescale of the development and some are likely to be doomed to failure. Some also involve shifting large quantities of peat around which raises questions of further carbon loss as well as the logistical issues of storage of peat. We are left wondering whether this has more to do with peat disposal rather than realistic ambitions to restore habitat/hydrology. A heathland restoration project at Ward of Scousburgh commenced three years ago and the results have been so discouraging that in the south mainland the agencies responsible are currently wondering whether it is worth continuing.

Slope stability - There appear to be clear doubts held by some peatland ecologists as to whether the Viking Energy analysis of this issue is appropriate. It would seem that the ground water level is a major factor in analysing slope stability, but by their own admission Viking Energy made an assumption of water level heights rather than recording actual measurements. It has also been argued that their modelling is suited to mineral soils not peat, the latter can be 80% or more water. Interestingly there seems to be no mention here of grazing regimes yet there is little doubt, among environmentalists resident in Shetland, that overgrazing can be a key factor in the cause of peat slides e.g. those at Channerwick, in the south mainland, in 2003.

Peat slides - Despite the weaknesses with the analyses identified above Viking Energy are confident that no peat slides will occur - *'provided recommended mitigation measures are used the risk of peat landslides occurring at these locations is insignificant'*. We must all hope this confidence is not misplaced especially as there appears to be little in the way of contingency plans for a large event. A significant peat slide could of course result in widespread damage and even loss of life.

Peat extraction - There still seems to be no detailed plan as to how and where the enormous quantities of peat extracted during the development are going to be stored and disposed of. Surely this is a crucial consideration that needs to be resolved before planning consent is granted. Moving large amounts of peat around is likely to cause further carbon emissions and further damage to the site.

GEOLOGY

For the last five years Shetland Amenity Trust, together with Shetland Islands Council, Scottish Natural Heritage, Highlands and Islands Enterprise, the Anderson High School, the Association of Community Councils, Shetland Tourism Association, local community groups and tourism operators, has been working to develop the whole of Shetland as a Geopark.

We are currently waiting to find out if our application for Geopark Shetland to become a member of the UNESCO-sponsored Global and European Geopark Networks has been accepted.

Membership of the networks does not of itself preclude industrial or commercial developments, however the preservation, enhancement and promotion of landscapes are key elements of the Geopark ethos.

We are concerned that the Viking Energy proposal, because of its vast scale relative to Shetland's landscape, is at odds with this ethos and may adversely affect the viability of Geopark Shetland.

ARCHAEOLOGY

The Trust's Archaeology Section employs the County Archaeologist and provides archaeological advice to the local authority's Planning Department under a Service Level Agreement. As such, it will be providing a detailed response as part of the Planning Department's submission but it is important to note the issues that will be addressed within this submission.

The Trust is aware that an external contractor has been undertaking the archaeological section of the Environmental Statement since 2004 but their contact with the Trust's Archaeology Section has been very limited, and initiated as much by our Section as much as the contractor. This is extremely disappointing given the Trust's role in Shetland's archaeology and the size of the development being assessed and we believe that the lack of regular contact is evident within the final report.

The proposed turbine sites begin at about the 50m contour with tracks and water courses affecting lower areas. A Viking Longhouse has been excavated at Belmont, Unst at close to the 60m contour and there are also other prehistoric farmsteads at similar heights on the west side of Shetland. It is realistic, therefore, to assume that significant archaeological remains will be affected by this development but, unfortunately, the report plays down the significance of such sites on the basis that they are domestic and their visual setting is therefore unimportant.

Indeed the survival of Neolithic and Bronze Age houses, settlements, field systems and burial cairns in the hills and beneath the peat of the central and western Shetland mainland is considerable and is of major national importance.

In drawing up its submission to the Planning Department, the Trust's Archaeological Section has sought to address the following questions: 1) How far is the Environmental Statement comprehensive?; 2) Do the claims made within the Statement stand up?; and 3) What is the mitigation proposed and is it appropriate?

Question 1 – How far is the Environmental Statement Comprehensive?

It was noted that the Environmental Statement is based on desk-based assessment and walk-over survey which took place between the 22nd-27th June and 26th Sept-6th Oct, 2005. Further work carried out between 2nd-11th September, 2008 solely addressed the visual impact on scheduled monuments and listed buildings. It was further noted that during these periods the weather and visibility was very poor.

The areas walked during this survey were covered by transects 50-100m apart. Given the nature of the terrain, transects would need to be walked at intervals of 5-10m in order to pick up the majority of sites in the Shetland landscape. This is

borne out by the fact that the walk-over survey only located one previously unrecorded site, identified as a Prehistoric Homestead (known locally as Lizzie Leaper's Hoos). It would be expected that there would be indications of sites, such as stones protruding in abraded peat sections which might add tantalising glimpses of what lay underneath but nothing of this nature was recorded.

Much of the area of the proposed wind farm is under peat and it is probable that this will conceal archaeology, under and within the peat. It is reasonable to expect that at least some intrusive pre-determination evaluation would have been carried out, at least in areas where there is less than 1m depth of peat. This evaluation should have taken the form of cutting-edge geophysical survey and associated evaluation excavation but this has not been done and it is, therefore, impossible to substantiate the claim within the report that "there will be minor overall residual effects on archaeology".

Question 2 – Do the Claims Made Within the Statement Stand Up?

We find that one of the most astounding claims within the report in regards to archaeology is that "It is therefore safe to say that the project has advanced the knowledge of the cultural history of the Shetland Islands". The lack of any sub-surface evaluation, the methodology used within the walk-over survey and the discovery of only one unrecorded site does not bear this statement out.

The claim that the protection or excavation of 3 sites means that there will be "minor overall residual effects on archaeology" has already been addressed under Question 1.

Question 3 – What is the Mitigation Proposed and is it Appropriate?

The report seeks to protect/excavation 3 sites:

- features relating to the Catfirth Linen industry
- the "Homestead" (Lizzie Leaper's Hoos)
- a horizontal mill

With the exception of these 3 sites, the report suggests that ground breaking work would be mitigated with watching briefs, but this is weakened by the statement that "Where plant is operating simultaneously across the site several watching brief officers may be required to attend to ensure full monitoring"). The report says that this would fall within the remit of an Environmental Clerk of Works to oversee.

We believe that evaluation should be undertaken for every turbine and crane standing, every road, every cable trench and this should comprise a 20% trial excavation. Geophysical survey (carried out in blocks of no less than 1 hectare)

might allow this figure to be reduced should geophysical survey be informative within this type of landscape). Appropriate mitigation for effects of changed water courses, etc. should also be undertaken. The results of this work would determine whether sites encountered should be fully excavated or whether micro-siting would provide a better alternative. This is a decision which would normally be taken in consultation with the regional archaeology service on behalf of the Planning Authority and, as already stated early, as the Regional Archaeologist works for the Trust we believe the mitigation suggested here is the correct course of action rather than the mitigation proposed in the Environmental Statement.

In addition to the evaluation suggested above, we also believe that a full watching brief should be carried out for all ground breaking works. This is the appropriate response when the chances for finding archaeology are reduced, it is not a tool by which to discover archaeology which could reasonably be expected to exist. The only exceptions to this would be in cases agreed on an individual, case by case, basis with the Planning Authority's archaeological advisor.

To ensure that these works are carried out appropriately, it would be necessary to employ a suitably qualified and experienced Archaeological Clerk of Works throughout and not rely upon the services of an Environmental Clerk of Works. In addition, suitably qualified watching brief staff would be required for every machine which breaks ground concurrently. These are principles that are applied to developments of all types and sizes. The only difference here is one of scale which is compounded by what we believe is a lack of pre-determination evaluation being carried out.

In conclusion on the matter of archaeology, we believe that the lack of sub-surface evaluation, together with the inadequate walk-over survey, make this a report which we feel is inadequate for purpose. If the proposed wind farm goes ahead on this basis, it will be necessary to compensate for these inadequacies once the development has started. This is a risky strategy for the developer as the discovery of archaeology late in the process is both delaying and potentially costly. We would strongly advise Viking Energy to address these issues before starting in order to manage the risk which has not been addressed through the report.

CULTURAL HERITAGE

The Shetland cultural landscape is primarily one of post-Medieval date, wherein prehistoric structures and cultivation have been subsumed by later development in infield areas, or by peat and vegetation in the moorlands. Whereas in most infield areas - the old farming townships - there is a continuum of ongoing modern development, this is not the case in the moorlands. These moorlands are remarkable as a record of many centuries of human usage, not just from the fact that ancient structures survive in the peat, but also that farming practices introduced in the Middle Ages survived into the 19th century, and the lack of any industrialisation has ensured this landscape is intact. For all the detailed small-scale data in the Environmental Statement, there is a fundamental lack of understanding of this in Section 13, Cultural Heritage. All of Shetland's landmass was at one time divided into township and common grazings, but the areas proposed for development are special in that they have substantially remained free of 20th-century and later development, such as roads, buildings, and even fences are few. In many other parts of Shetland this is not the case, where reseeded has altered the landscape. Viking Energy's assertions that the hills are in "poor condition" are highly tendentious.

Traditional usages of the *skattald* (common grazings) included pasture, harvest of heather and rushes for ropes and thatching, cutting peat for fuel and turf for roofing, and mowing rough grass for fodder. Much of the year farms' livestock lived on the hills, from horses and cattle, to swine and poultry. The vulnerability of Shetland's moorlands mean huge development could eradicate a cultural landscape untouched for millennia. The report is partial in its treatment of the anticipated impact of the wind farm: predictions are made for turbine visibility and siting, but no mention is made of the 70 miles of roads, substations, the exploratory pits and production quarries (euphemistically termed "borrow pits"). The impact of these would be **no less harmful** to the cultural landscape than the turbines themselves and the site works.

Methodology

Whilst a large-scale archaeological site survey has been undertaken, the historical research is weak or imbalanced. Section 13.5.1 concedes that "within Shetland the quality and preservation of archaeological monuments of almost all types is remarkable", and that "the remains of post-Medieval and pre-Clearance society abound", but nothing is said of the fact that the imposition of the roads and turbines would ruin the same pristine landscape that preserved the sites in their context in the first place.

There is a bias toward recorded sites, either Listed Buildings or Scheduled Monuments, which makes no allowance for the fact that it is highly likely new

structures would come to light during construction: absence of evidence is not evidence of absence. This is precisely the terrain that one might expect sites. Furthermore, the survey relies on built structures as evidence of human intervention, disregarding the aforementioned activities on the *skattalds* that leave evidence of hill-pasturing, peat cutting, mould collection, etc. There is an **imbalance** due to over-reliance on sampling from the Royal Commission on Ancient & Historical Monuments' database, such that mention is made of e.g. a mill at Firth (an unprepossessing specimen), but no recognition of significant vernacular buildings at e.g. Grunnafirth.

The thrust of the Environmental Statement's search for cultural heritage is best evinced by the statement in Major Uplands dealing with Landscape Character, section 8.5.6(a), where it is stated that "There is no tradition of settlement in these areas and human intervention is limited to access roads, peat cutting, sheep grazing and some masts/aerials." In like vein, the Cultural Heritage report is solely confined to structures, making it a foregone conclusion that there would be little to find in their survey. This is inevitable due to the defective research methodology that has not used historical research into cultural practices. In any case, 8.5.6(a) omits to mention there was settlement in moorland areas outwith the era of recorded history, so such findings are erroneously partial. Linked to this is place names evidence that add to the understanding of cultural landscapes, for example Oxnaþøll, in the Delting quadrant of the wind farm, where oxen grazed in Medieval times, or the Ari, in the Nesting quadrant, which was a cattle pasture. There are countless more examples that would, like these two, be directly and deleteriously impacted upon by the scheme. Viking Energy have **completely neglected** this line of research.

A study of historic maps was undertaken, but this is frankly incompetent. If the intention was to demonstrate former landuse - "They provide useful data about changes in land-use, boundaries, buildings and place names" (Section 13.4.2) - Viking Energy have singularly failed to find anything. This is inevitable considering the curious choice of nine sources. Many comprise marine charts (Preston 1781, Depot de la Marine 1804, Hydrographic Office 1833), whose sole purpose was to record soundings and hill profiles. Others are so inaccurate as to be totally useless in providing any meaningful data for the present study (Blæu 1654, van Keulen 1730, Moll 1745). The only coherent source is the 1880 Ordnance Survey. Conversely, no use whatsoever has been made on manuscript *skattald* maps for the area affected (Weisdale 1850s, Delting 1860s, Aithsting 1860s). This is a **serious deficiency**.

In the section 13.5.3 Historical and Archaeological Background there is **inadequate understanding** of the crucial cultural break at the c.800 Viking colonisation of Shetland, whereby Medieval constitutes a continuum from c.400 to c.1600. This colonisation gave rise to the distribution of the township/grazings that persisted until the 19th century, and also to building types and farming practices. The core settlements of recent centuries were medieval centres. Insufficient cognisance is

made of this because medieval townships like Hubansetter would doubtless yield finds, given settlement continuity and “dense concentration of crofting (*sic*) remains” (section 13-9).

Section 13.5 talks of a “crofting period” but deals with post-medieval, pre-crofting. Some use is made of historical sources to elucidate facts about settlement, but the some of the most **crucial early sources have been ignored**, namely:

- *Shetland Documents 1 and 2* – covering 14th century to early 17th century
- *Shetland Court Books* – covering early 17th century
- Rentals – from 1628, 1716, 1774, 1832

Stray finds of archaeological and other cultural material may offer indication of settlements, yet no effort was made to plot Shetland Museum finds from the affected parishes to determine a distribution pattern. This again is a **notable deficiency**. Specific written historical research has been omitted. For example, the Viking Energy report makes scant mention of J. Walker’s farm, but does not realise its extent at Swinister, the significance of it, and the fact that it extended very far into the Delting quadrant of the wind farm. All this should have been verified by referring to sources such as *John Walker’s Shetland* (W. Gear 2005) and articles in *New Shetlander* in 1996 and 2002. Oral history sources are entirely unutilised, such as a 17th/18th-century burial site in Nesting not being mentioned. Historical research must be painstaking, all the more so for a scheme of such scale, but this has manifestly **not been the case** in this instance.

There is an overly mechanistic reliance on classifying significance of the various buildings, and pursuant to this, the method of rating the direct impact of the wind farm on such sites. Naturally, Listed/Scheduled sites are demonstrably more significant, but 13.4.4 admits that “criteria for judging archaeological sensitivity are gradually evolving, with an increasing trend towards including more recent types of structures.” Within Shetland there is a wealth of research past and ongoing on pre-Medieval buildings of all types, but serious study on vernacular buildings of post-Medieval date is a nascent field. The Viking wind farm would set back such study by damaging cultural landscapes before study has advanced. The report correctly states that evaluating sites’ value combine factors of age, rarity, and condition, but these **cannot yet be evaluated** considering study has only just begun in Shetland.

There are other factors beyond the monuments record that have been ignored, all stemming from inadequate historical research. **This would necessitate extensive work** to be done to make a complete assessment of the impact on the cultural landscape. The manifold features within the development area include:

- Subsistence farming: quarry sites for production of millstones
- Subsistence farming: sites for transhumance

- Subsistence farming: reconnaissance lookouts
- Commercial farming: sheep farm at Swinister
- Military: First World War lookout posts

On a project of this scale (the largest in Shetland history) it would be expected that an extremely rigorous research would be undertaken. Evidently this has not been the case, and even in the instance of the fieldwork Section 13.4.3 concedes that there was very unfavourable visibility that affected part of the survey. No effort has been made to rectify this. The officer compiling this section of the Trust's representations undertook a field trip in Weisdale in excellent visibility, and an undiscovered denuded Neolithic cairn was found on one of the tracks traversed by Viking Energy's archaeologists. Section 13.8 asserts that the survey has advanced knowledge, but more prudently states at 13.4.4 that "selection of buildings and sites/monuments for Listing and Scheduling is an ongoing activity". Section 13.2.1 deals with gathering of data for all cultural heritage features within 1 kilometre of the site and rates their significance, but research on such an extensive scale can only be initial because nothing similar has been attempted before in these moorlands. An industrial project of this size requires much more than partial research methodology.

The parameters denoting which effects are variously rated as negligible, minor, moderate, or major in visual impact, are **questionable**. Of course, much of such speculations are subjective, but Section 13.6.2 on the significance of visual impact of turbines comes to some bizarre conclusions. Examples include visibility of 116-154 is "minor" at Lunna (a noted tourist destination, also of historic interest), 78-115 is "minor" at Loch of the Garths, 78-115 likewise "minor" at Lingness (a particularly scenic area of Shetland). Further west, visibility of 38-77 is still "minor" at Flemington. How these conclusions were reached is opaque. At Graven there is "major" impact with 1-37, but Sandsound rates "negligible" at 1-37 because of there being a modern settlement. Compare also visibility of 78-115 rating as "major" at the Skeo of Gossaford, Delting, but as "negligible" at West Yell. Most bizarre are conclusions in the Non-Technical Summary that the visual effect on major settlement of Brae and Aith would be nugatory, as these places predominantly face west! In both places the settlement expansion is on the west, facing east, and houses on the east have east-facing aspects.

Mitigation Strategy

Page 13-12 deals with "Receptor sensitivity", and states that the wind farm is only a temporary feature, at 25 years' working life. It is moot what constitutes "temporary", for even houses have a lifetime, and to most minds 25 years is "permanent". In any case Viking Energy's statement is extraordinary, given that it **ignores the absolutely permanent** 70 miles of roads, 154 concrete turbine bases, the quarries and investigative pits, all of which are ignored despite the fact they would be in the cultural landscape that support the aforementioned buildings/processes. The

Cultural Heritage report states that distance from the development mitigates the effects, but the colossal nature of the wind farm negates this; it would be visible over most of Shetland, considering the geography of rolling hills and deeply indented coastline. The Scottish Executive's policy P.A.N. 45 states that a 70-metre turbine sited less than 2km from habitation is a prominent feature, so self-evidently the extremely large turbines in, say, Weisdale constitute a mass of very prominent features indeed. Viking Energy consider that there are only significant visual effects within 5km of large turbines, a testimonial coming from the British Wind Energy Association, a wind farm trade association. Even in this case the testimonial is not related to turbine height, so the figure is unhelpful.

Scottish Historical Environment Policy (2008) deals with ways to prevent inappropriate and unsympathetic impact of developments in historic cultural landscapes. Viking Energy's Environmental Statement at page 13-13 deals with visual attenuation. Given that the wind farm would be largest ever civil engineering project in Shetland, disguising substations or turbines with "local/traditional materials" or sympathetic colours is unworkable and impractical and not at all comparable with the effective efforts taken during the 1970's to make the oil storage tanks at Calback Ness, Sullom Voe, blend in with their surroundings. The report also considers that the complexity of the landscape is a factor in mitigation; the more complex the view, the more readily hidden by the background. The proposed site is virtually entirely heathery moorland of a decidedly non-complex appearance, and the visual impact would be **highly inappropriate**. The report mentions screening with other features, but obviously **no visual obstacle** would ever be effective, given the open nature of Shetland's landscape. Page 13-31 concedes that in only 9 of 91 buildings will turbines not be seen, and from only 23 of 134 monuments. Plus, no mention is made of the roads (many of which are double-track), set on otherwise open heather moors, not in the least sympathetic to a historic cultural landscape. Section 8.5.6(a), Landscape Character, recognises that "The Major Uplands are distinct from other parts of Shetland which are generally low-lying. They have a large scale, undeveloped quality and form an important backdrop to the lower peatlands", adding "This character area is typically exposed in nature and provides panoramic views in clear weather." Thereby, the proposed scheme contradicts its own findings, for no concession is made to the fact that the development would destroy the same characteristic undeveloped backdrop that is the main component of Shetland's panoramic scenery.

The report likewise suggests that the morphology of buildings could allow for the visitor to appreciate structures without imposition by the turbines, but this is invalid because all cultural remains in the scheme environs are roofless. Furthermore, visual links are important for some post-Medieval structures, yet page 13-16 makes **no assessment** of visual interlinking. This is of great significance regarding watch sites, but this has been ignored.

ACCESS, RECREATION & TOURISM

Tourism

One clear weakness with this section is that Viking Energy have singularly failed to ask the tourists that visit Shetland what they think of the development.

The Environmental Statement has analysed tourist surveys and concludes that the majority of visitors do not visit the development area and it will have little impact on tourism/recreation. However this fails to recognise that these areas are regularly accessed by anglers and members of the Shetland community for hillwalking, birdwatching, etc. and also contradicts the statement within Viking Energy's Habitat Management Plan which states:

'The peat dominated landscape of Shetland also provides tourism opportunities because a significant number of tourists are interested in bird watching or "getting away from it all" on the open hill. All of these experiences are dependent upon the maintenance of a 'wild environment' and the distinctive faunal and floral assemblages that have developed on Shetland over the past ten millennia.'

Furthermore the Environmental Statement identifies the main reasons why holiday visitors come to Shetland and also the main highlights from their visit. The provisional results suggest that the most important factors for tourists were peace and quiet remoteness, scenery, landscape and wildlife including birds. This corresponds with the known triggers brought out in the Shetland Visitor Survey 2005/06, already referred to above.

It is probably true to say that the Viking areas are not well promoted and not as regularly accessed as other parts of Shetland. That does not diminish their importance, however, as a natural resource for Shetland and is a significant factor in maintaining these areas as wild and relatively undisturbed habitats.

Access Plan

Part of the Environmental Statement's mitigation for the key effect on tourism and recreation, namely changes to the landscape amenity is to *'develop an access management plan that maximises the potential benefits of the development through the provision of public access with organised tours, development of tourism view points, development of mountain bikes routes away from restricted areas, promotion of alternative walking routes and improvement in car parking'*. This is a key area of interest to Shetland Amenity Trust. It appears that public access will be restricted intermittently to the site during periods of the construction phase and permanently to some sites although these are yet to be listed. Restricted access during

construction is to be expected as there is likely to be an element of risk and danger to members of the public. Shetland Amenity Trust really needs sight of this plan before it can comment in detail.

Without careful consideration, enhanced access could increase negative effects on the natural heritage during and beyond the lifetime of the development by encouraging public and vehicular access to areas that contain important and sensitive populations of birds and habitats. Furthermore a network of tracks, viewpoints and car-parking facilities will detract from the peace, quiet and remoteness of these wild areas that is acknowledged as a major feature for recreational use and visitor perceptions.

WOODLANDS & TREE PLANTING

A number of references to woodlands and the planting of trees and/or shrubs are made in the Environmental Statement. As the conservation and encouragement of creating woodlands is an important remit for Shetland Amenity Trust, it is essential to examine these in detail. References are made to:

- Biomass
- Use of trees and/or shrubs for visual screening
- Use of trees and/or shrubs for dust control
- Restoration of native woodland
- Impact on existing woodland

Biomass is mentioned in Chapter 2 The Background as follows:

“2.5.2 Biomass

(b) Shetland

Shetland is not a suitable environment for growing biomass resources. There is no commercial forestry and limited arable agriculture. Any significant biomass would need to be imported. There are no power generation facilities on Shetland which are suitable for co-firing.

Consequently biomass was rejected by the partners as a technology in Shetland.”

Comment: While no-one should pretend that growing biomass on a scale to produce electricity for Shetland is a realistic option, the statement that “Shetland is not a suitable environment for growing biomass” is a sweeping one – and neglects the facts that short rotation coppice is mentioned in the Shetland Woodland Strategy (to which reference is made elsewhere in the document), that Shetland Amenity Trust is engaged in the international PelleTime Project (www.pelletime.fi) which is conducting biomass trials in Orkney and Shetland, and that Shetland Heat Energy And Power (SHEAP) are interested in using biomass in future District Heating Schemes.

Woodland Screen Planting etc. is proposed in Chapter 9 Visual Impact (9.6.3. Mitigation) as follows:

“(a) Woodland Screen Planting

Woodland screen planting consists of a mix of native woodland species and non native, faster growing ‘nurse species’. Non- native species would be specifically chosen for their ability to grow in harsh northerly climates therefore helping to more

quickly establish a woodland screen (within a period of ten to fifteen years) while providing a more desirable microclimate for the native species to establish. The primary initial role of this type of planting would be to provide a degree of localised screening of the proposed development therefore reducing potential visual impacts.

(b) Native Woodland Planting

Native woodland planting would consist of a mix of native tree and scrub species and would primarily be used to improve the scenic quality of a landscape while providing habitat opportunities and screening in the longer term. This planting type would generally be associated with settlements and existing blocks of woodland.

(c) Native Scrub Planting

Native scrub planting would consist of a mix of native species and would primarily be used to provide additional habitat opportunities, particularly along watercourses.”

Comment: The use of trees for screening is highly unlikely to be effective, primarily because of how long it would take them to grow to sufficient size – if ever (given the massive height of the turbines. It would also be highly dependent on where they were planted, and there would be great complexities involving land ownership, quality of ground, etc. Native woodland and scrub planting are considered as an offset, which is not the same as mitigation, in the sense of reducing the impact.

- Use of Trees and/or Shrubs for Dust Control

This is mentioned in Chapter 16 Air & Climate as a consideration (16.8.1 Air quality mitigation: “use trees and shrubs around the site.”

Comment: this seems to be an unrealistic and “desktop” consideration, because of the upland site of the wind farm, its peaty ground condition, and the extent of roads, location of quarries etc. Besides it would take a number of years before trees and shrubs would be large enough to be effective. Furthermore, dust is harmful to trees (and other vegetation) as it blocks the stomata (“pores”) which enable photosynthesis and respiration.

- Restoration of Native Woodland

Several references are made to this in the Environmental Statement, especially in the Habitat Management Plan. Regeneration of pockets of woodland along watercourses, planting in borrow pits, and a “corridor” adjacent to the trial HMP site (between the Loch of Voe and Laxo) are all proposed. Shetland Amenity Trust is considered as a potential partner, for advice and its nursery facilities.

Comment: While these measures may be beneficial for both Shetland and Shetland Amenity Trust, it must be stressed that their inclusion in the Environmental Statement is primarily proposed not as an offset or compensatory measure, let alone a mitigation, but as a good will gesture. Chapter 10 Ecology states:

“10.7.9 Habitat Mitigation and Compensation

(b) Habitat enhancement

Another opportunity exists to enhance watercourses by encouraging the regeneration of riparian vegetation and in particular, by establishing areas of native woodland, a habitat completely lost due to centuries of grazing. There is ample evidence that riparian habitat regeneration would directly benefit trout populations and associated species.

It is important to recognise that any habitat compensation and enhancement work needs to be agreed in consultation with land owners, crofters and their representatives. Therefore, whilst the defined compensation works should form part of planning conditions to specifically compensate for direct habitat loss, the additional habitat enhancement works are not necessary to compensate for losses. These enhancement opportunities and the commitment by the Viking Energy Partnership to deliver them exist due to the size and scale of the proposed development and the belief that the wind farm should achieve much more for ecology than neutral or no significant impact.”

Comment: This offer should in no way detract from the efficacy of the mitigation measures proposed, in particular the restoration of blanket bog, nor from any adverse effects that the wind farm will have on the environment and community of Shetland. The above statement does not sit well with the Habitat Management Plan in which woodland creation forms a significant element.

There are also some questionable proposals, for example the use of borrow pits for planting woodland. Technical Appendix 14.4 Estimated Peat Extraction Volume and Potential Reuse Options goes to great lengths to examine the backfilling of borrow pits with surplus excavated peat (estimated as over 500,000 cu. m), and concludes: “...it is apparent that the preferred option is to use surplus peat for restoration of borrow pits on site.” (14.4.9 Conclusions). Elsewhere in the Environmental Statement it is stated that borrow pits “will” be used for this purpose. If this is to be the case tree planting is not an option.

The use of a woodland (and grassland) corridor between Loch of Voe and Laxo would have to be examined in more detail, as would the planting of burns in the uplands of the Nesting quadrant, as is mooted in the HMP trial site. They may be, or contain, areas of deep peat which would not be suitable for tree planting.

As for regeneration, it is extremely doubtful that any relict tree sites that may exist within the wind farm site and study area contain enough diverse woodland to enable this to occur spontaneously.

- Impact on Existing Woodland

Comment: The Environmental Statement concludes that there will be no ecological impact on existing woodland, in particular the Kergord plantations, which are in the wind farm's Kergord quadrant and are also an SSSI. There is no reason to believe otherwise, but it should be noted that the proposed Interconnector Cable is routed through areas that contain this woodland, and may have an impact.

That there will be landscape and visual impacts, and possibly a noise impact, however, on the Kergord valley, of which the woodlands are a significant feature, is another matter entirely.

In conclusion, on the matter of Woodlands and Tree Planting, there are proposals concerning woodland in the Environmental Statement which theoretically could benefit not only the Shetland environment but Shetland Amenity Trust itself, but such proposals should not be considered in isolation from the rest of the Environmental Statement and all the implications of the wind farm that are discussed within it. Nor should it be forgotten that some of the proposals are unrealistic (i.e. visual screening and dust control), dismissive (i.e. biomass) and contradictory (i.e. borrow pits).

There are enough questionable aspects of the Environmental Statement as a whole to outweigh any potential benefits that woodland and tree planting might achieve.