

## **A1. INTRODUCTION**

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### **A1.1 OVERVIEW**

#### **A1.1.1 The 2009 Viking Wind Farm Proposals**

In May 2009 the Viking Energy Partnership (VEP) submitted an application under Section 36 of the Electricity Act for consent to construct a wind farm in central Mainland, Shetland. To be known as the Viking Wind Farm, the proposed project comprised 150 wind turbines and associated access tracks, anemometer masts, substations and cabling; and construction compounds, laydown areas, public road improvements and areas of search for borrow pits associated with the construction process.

#### **A1.1.2 The 2010 Viking Wind Farm Addendum**

The proposed wind farm has been reduced in size and substantially revised:

- 23 turbines have been deleted from the 2009 proposals, leaving 127 turbines and associated infrastructure.
- About 14 km of access track has been deleted, leaving about 104 km remaining.
- The remaining track network has been redesigned. Previously the network consisted of tracks of 6m and 12m for single and double width tracks respectively. The double width tracks would now be built to 10m width, and would be reinstated to single width status following the completion of construction works.
- Two anemometer masts have been deleted, leaving nine remaining.
- 13 borrow pit 'areas of search' are now proposed, compared with 23 presented in the 2009 proposals. One 'area of search' is new for this Addendum. All have been assessed in detail. Two of the borrow pits are alternate locations, so of the 13 proposed borrow pits, 12 would actually be opened.
- All development in the north east 'Laxo to Collafirth' area has been deleted from the proposed wind farm.

More details of the proposed development are given in Chapter A4.

#### **A1.1.3 Pre Application (2003-2009)**

Appendix 4.7 of the 2009 Environmental Statement (ES) described and illustrated the design process developed and implemented for the Viking Wind Farm. Throughout the pre-application process VEP consulted with key stakeholders such as Shetland Islands Council (SIC), Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA), Historic Scotland and the Royal Society for the Protection of Birds (RSPB).

VEP was, and remains, confident that the proposals would have resulted in substantial net environmental, social and economic benefits for people in Shetland, as well as making a significant contribution toward Scotland's ambitions for generating renewable energy and addressing the causes of climate change.

#### **A1.1.4 The Interconnector**

The Viking Wind Farm requires a transmission connection to the national electrical grid. A proposed connection has been developed by the regional electricity company, Scottish Hydro Electric Transmission Ltd (SHETL). SHETL has submitted various consent applications for component parts of that connection. These applications are accompanied by their own Environmental Statements. Although the projects are mutually dependent, the applications are separate and are being dealt with by separate planning processes, partly because they are subject to different sections of the relevant legislation. SHETL has received outline consent for a converter station in Moray and consent under Section 34 of the Coast Protection Act for a sub-sea cable between Shetland and mainland Scotland. A converter station in Shetland is awaiting determination.

#### **A1.1.5 Post Application (2009-2010)**

The May 2009 application was followed by a period of public and stakeholder consultation. VEP agreed to extended consultation periods for the public and the statutory consultees. VEP has since undertaken a review of all the feedback arising from the consultation. A table of comments and objections from statutory consultees (along with details of VEP's response) is presented in Appendix A1.1.

Following a review of the feedback, VEP decided to revisit the 2009 design taking the objections into account.

As a result, in October 2009 VEP confirmed their intention to produce an Addendum to the ES revising the information already submitted in the 2009 ES.

#### **A1.1.6 The EIA team**

The ES Addendum has been compiled by the Viking Energy Partnership with advice and assistance from environmental consultants, BMT Cordah. The team identified in Table A1.1 undertook specialist assessments.

**Table A1.1: The EIA project team**

Planning	Jones Lang LaSalle
Landscape Character	ASH Design + Assessment
Visual Impact	ASH Design + Assessment
Ecology	BMT Cordah and Alba Ecology
Ornithology	Natural Research (Projects) Limited and Alba Ecology
Noise	BMT Cordah
Cultural Heritage	AOC Archaeology Ltd
Soil and Water	Mouchel and Albion Environmental Ltd
Roads and Traffic	BMT Cordah
Air and Climate	BMT Cordah with review by Macaulay Land Use Research Institute
Telecommunications and Aviation	SSE Renewables Ltd and Osprey Consultants

Recreation and Tourism	BMT Cordah
Socio-economic	Andrew Blackadder Associates

## **A1.2 THE ES ADDENDUM**

### **A1.2.1 Context**

The 2009 application was accompanied by a very substantial ES, much of which is still relevant to the revised scheme. The purpose of this ES Addendum is to address the issues raised by consultees and to report on the changes to the environmental assessment resulting from the project redesign. Therefore *this Addendum does not replace the 2009 ES*; rather, the two documents must be read in combination. However, Ornithology (Chapter 11) has been presented as a completely revised text. In all cases, the Addendum chapters report how the redesign has affected the conclusions of the 2009 ES (if at all). In most cases the reports are brief. However, where more detail is required it is provided. In chapters where the methodology or presentation of assessments has also changed then this is discussed. The Addendum covers all aspects of the redesign, any supplementary information used, any revised assessments and any revised mitigation proposals.

### **A1.2.2 Structure of the ES Addendum**

The ES Addendum comprises four separately bound documents:

- Volume 1 - Non Technical Summary
- Volume 2 - Environmental Statement (Written Statement)
- Volume 3 - Figures (plans, illustrations and photographs)
- Volume 4 - Appendices

To make direct comparison easy, the chapters in the Written Statement section of the ES Addendum are numbered with the same chapter numbers as in the 2009 ES, with an “A” prefix. For example, Chapter 10 of the 2009 ES related to non-avian ecology; therefore Chapter A10 of the 2010 ES Addendum is concerned with the same subject. Figures, appendices and appendix figures are given the same treatment; not all figures and appendices have been re-issued. Where additional figures are provided, they are numbered in the same series as the other figures for that topic, but given a new number.

For practicality, in producing the Addendum VEP has sought to focus on the objections from the statutory consultees. The changes made as part of the Addendum process also address the common concerns of the non-statutory consultees.

### **A1.2.3 2009 ES Consultation**

Extensive consultation took place over several years in advance of submission of the 2009 ES and Section 36 application. This process has continued with the submission of the 2010 ES Addendum. Where appropriate, details of the consultation are given in the relevant chapters. A Consultation Report and Consultation Audit covering the project consultation prior to the 2009 application are published alongside this ES Addendum.

In accordance with the Section 36 application, VEP has made all application documents, including the 2009 ES, available online or to purchase and in advertised public locations.

#### **A1.2.4 Addendum Consultation**

VEP has consulted further with several parties who provided feedback during the public consultations undertaken as part of the Section 36 application process. These consultations have focused on the main statutory consultees (e.g. SNH, SEPA, Historic Scotland and Shetland Islands Council) but have also included detailed discussions with non-statutory consultees (in particular RSPB in relation to birds, and Shetland Amenity Trust in relation to Cultural Heritage). The post-application, pre-Addendum consultations have been more focused towards discussion of specific issues arising from the public consultation submissions and have involved meetings and correspondence around particular themes.

Viking Energy invited local group Sustainable Shetland to meet and discuss their objections to the project but the invitation was declined.

### **A1.3 CHANGE PROCESS**

#### **A1.3.1 Previous Design Process**

Details of the design process which led to the proposed 2009 layout were presented in Appendix 4.6 of the 2009 ES.

#### **A1.3.2 Rationale for changes**

Comments were received on almost every aspect of the proposals although the effects of the proposed wind farm on bird species, on peatlands and on archaeology were of key concern. All responses received as part of the public consultations undertaken for the Section 36 application process were examined and the merits of the content considered. Issues generally related to:

*a) The magnitude of assessed effects:*

Some suggested that the magnitude of predicted environmental impacts would be too high.

*b) The methods of assessments used:*

Many of the assessments were necessarily complex and some involved innovative methods. These were intended to refine standard approaches or provide greater scientific validity. There was no suggestion VEP had attempted to play down the adverse impacts, or over-emphasise the beneficial impacts, in the ES. In fact SNH, for example, specifically regarded some of the parameters used in the ornithology assessment as being unnecessarily pessimistic, and requested that they should be changed.

In contrast, the use of a standard government-recommended method for the carbon assessment was inadequate to address complex challenge by stakeholders. Review by expert academic consultants has indicated that VEP's initial assessment was substantially valid, but the default parameters upon which the 2009 assessment was based were, again, unnecessarily pessimistic.

*c) The methods of presentation of the assessment:*

Some stakeholders raised queries which had really been answered in the ES. Often this concerned data that had perhaps been presented in Appendices. There were also inconsistencies between different assessments in relation to common statistics.

d) *The certainty of mitigations:*

Many assessments included commitments to mitigation measures to address or reduce predicted negative impacts thus ensuring a more acceptable residual assessment. Some stakeholders expressed concerns about whether particular activities would achieve, with certainty, the projected benefits. Stakeholders also queried whether VEP would be able to deliver some of the mitigation activities with sufficient certainty.

Table A1.2 contains details of the objections received from statutory consultees along with VEP's reaction (if any).

Appendix A1.1 contains details of comments and objections from statutory consultees along with VEP's reaction (if any).

Individual chapters also discuss comments and objections from other relevant stakeholders.

### **A1.3.3 Objectives**

The purpose of the redesign was to address the objections raised by statutory consultees, while meeting the requirement to maximise the site capacity for energy production. The redesign had to achieve these objectives while meeting the environmental criteria of acceptable impacts, informed by the relevant planning and technical guidance.

### **A1.3.4 Considerations**

- a) One of the key considerations for the Viking Wind Farm project is the requirement to pay for a sub-sea cable to export power to the mainland. It is likely that the Transmission Network Use of System charge (TNUoS) for a project in Shetland would be significantly higher than for a comparable project on the mainland. Therefore, a 'critical mass' of development is necessary. Final details of the TNUoS charges remain uncertain. However, the financial aspects of the development are presented in Chapter A17.
- b) Any redesign has to meet the same technical requirements that the original design met. These include, for example, the maximum slope of the roads, the fact that turbines have a minimum spacing requirement and that they be located in areas where air flow turbulence is minimised.
- c) Regardless of limiting factors it was necessary to identify what the major objections were and what could be done (if anything) to address these. It was also necessary to identify any new information arising from ongoing or additional studies or from external sources and ensure that it was used if relevant.

### **A1.3.5 Approach**

The consultation responses were reviewed to identify potential design related issues and a number of areas were identified where design changes may be required. These were:

- Effects on the settings of Scheduled Ancient Monuments (SAMs);
- Ornithological impacts;

- Landscape and visual impacts;
- Ecological impacts;
- Other concerns including carbon payback, noise, aviation and construction management.

The effects of the redesign are complex. In some cases making a change in response to one predicted impact could cause a new impact; in other cases a single change may alleviate more than one predicted impact. It was decided that where there were alternative design options, then preference would be given to options which have the greatest overall benefit.

The following paragraphs set out our approach to the key issues.

### **A1.3.6 Cultural Heritage**

The Viking Wind Farm was designed to avoid all direct impacts on known archaeology (“direct” in this context meaning physical damage to features of archaeological interest). However, Historic Scotland and Shetland Amenity Trust raised concerns about indirect impacts on the setting of known sites.

In considering the objections all views and sites were revisited. A re-assessment of impacts on the settings of eight Scheduled Ancient Monuments was undertaken following Historic Scotland’s consultation response. Each monument was reassessed in the field and against wireframe views in order to assess the impacts of specific turbines on monuments’ settings. Turbines D1, D2 and D3 were identified as having a potentially unacceptable impact on the setting of the monument of Graven. These turbines have thus been removed.

Turbines identified by Historic Scotland for relocation or removal were considered with regards to their impact on the ability to understand and appreciate the significance of the monuments in their settings. It was concluded that the turbines would be a significant presence in the landscape when viewed from these monuments. However, the monuments are in poor condition, are some distance from the turbines, and are located at the heads of voes overlooking extensive land and seascapes which would be unaffected by the turbines. For these reasons it was concluded that the erection of these turbines would not significantly affect the ability of this and future generations to understand the monuments in their current settings.

There are two forms of impact that the proposed wind farm may have on cultural heritage.

- Potential disturbance due to construction activity.
- Altering the context in which some heritage is viewed.

Measures for avoiding disturbance due to construction activity are described in the Archaeological Management Plan, Appendix A13.5.

Changes to the context of important heritage sites would be addressed by a proposed “Neolithic Heart of Shetland Heritage Strategy”, to be implemented as part of the Viking Wind Farm and presented with this Addendum as Appendix A13.6. The purpose of the Strategy is to increase access to central Mainland heritage sites and to encourage the communities of Shetland to engage in the discovery, management, enhancement, interrogation and display of their cultural heritage.

More detailed explanation of this is available in Chapter A13, Cultural Heritage.

### A1.3.7 Ornithology

SNH objected to the 2009 proposals due to the magnitude of predicted impacts on nine species of birds and queried some of the study methods used.

The approach to the redesign is in accordance with SNH's July 2006 guidance document - *Assessing Significance of Impacts from Onshore Wind Farms on Birds Outwith Designated Areas*. In relation to birds, the design objective was that the proposed development should not "adversely affect the favourable conservation status of a species, or stop a recovering species from reaching favourable conservation status, at international or national level or regionally."

Initial population models were produced based on revised collision risk models. The collision risk models were used with other data, such as displacement sensitivity, to identify which turbines presented the greatest potential risks for different species. These data outputs took the form of spreadsheets with calculated risk percentages for individual turbines but were also translated into histograms which were used in the process of making decisions about potential changes. See for example Histogram 1 below.

Priority was given: firstly to removing proposed turbines causing high levels of risk for multiple priority species; secondly to removing turbines causing high levels of risk for single species but providing other improvements (e.g. ecology or landscape and visual impacts); thirdly to removing remaining turbines causing high levels of risk for single species; and fourthly to removing turbines causing moderate levels of risk for multiple species.

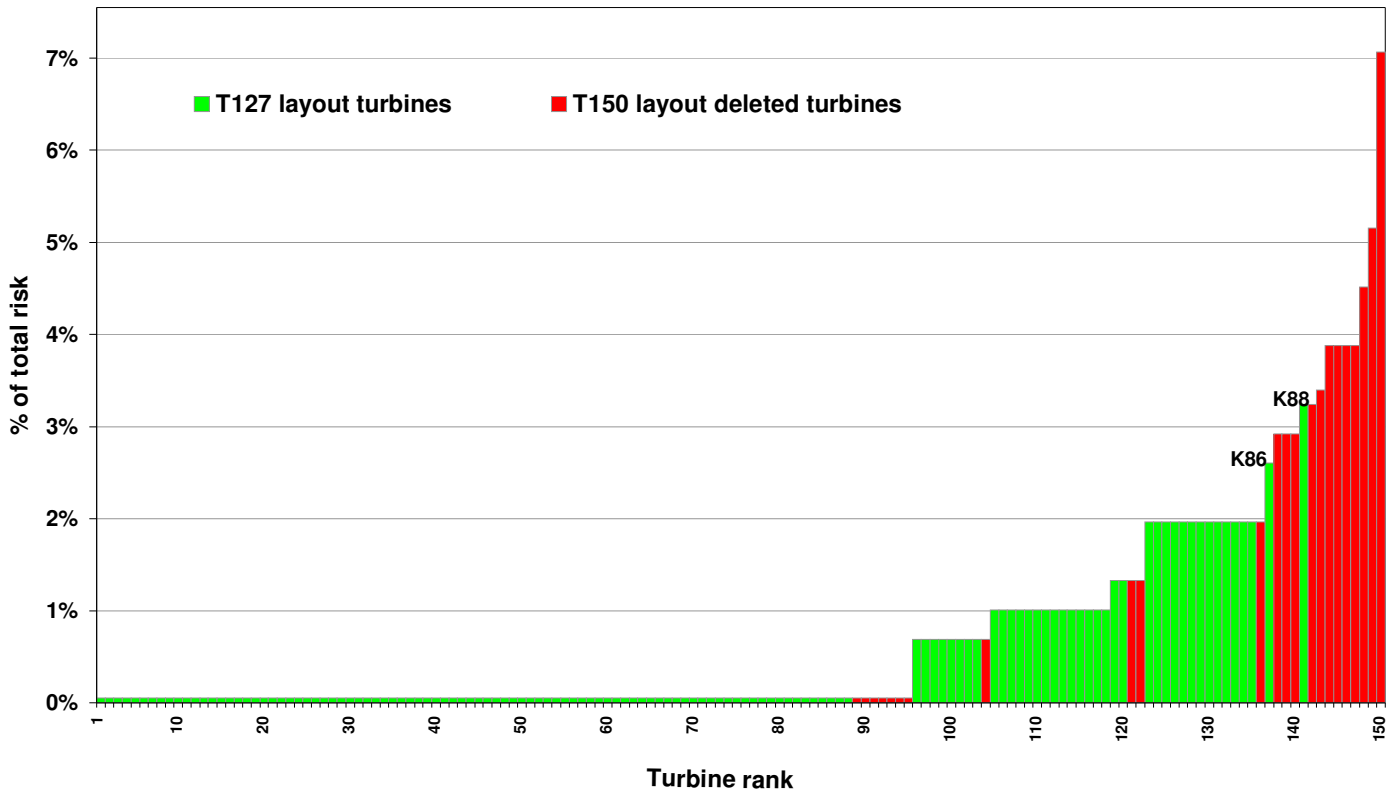
An interim layout based on 137 turbines, along with associated data, preliminary population models and graphs, was developed and discussed with RSPB and SNH. Their responses led to further refinements to the assessment methods and formed much of the basis for the final assessments presented in Chapter A11.

Consideration was given to all nine species noted as causing concern, with a priority placed upon whimbrel, merlin, red-throated diver and Arctic skua. A summary of the design actions for whimbrel is given below as an example:

#### Whimbrel

Although secure across Europe, the UK population of whimbrel, which is almost entirely within Shetland, has declined markedly in the past two decades. Therefore any wind farm disturbance or mortality would adversely affect the conservation status of whimbrel. The test according to SNH guidance in a declining population is therefore whether impacts would "stop a recovering species from reaching favourable conservation status".

Whimbrel are not evenly distributed across the site. A high proportion occur in regular hot spots (present every year) containing two or more pairs in relatively close proximity; See Figure A11.11. Layout changes within the core areas of hot spots aimed at reducing risks to whimbrel are likely to be more beneficial than changes outside or on the periphery of hot spots.



**Histogram 1: Risk percentage for individual turbines: Whimbrel**

The strategy was to target the removal of individual proposed turbines (and where possible associated tracks) that posed the highest risk to whimbrel. Hot spots of whimbrel activity were identified and turbines removed. This is complicated in places by other considerations that were taken into account, as shown by the example of turbines K84-K88 on the Mid Kame ridge which appear near the upper end of the risk histogram but are considered to pose less risk than indicated because of the large (approx. 100m) altitude difference between the locations of the turbines (on the ridge) and the whimbrel nesting habitat (on the Petta Dale valley floor). K88 and K86 are labelled in Histogram 1 above.

The changes made, together with more sophisticated methods to estimate flight activity, reduce predicted annual collision deaths by more than three-quarters from the 2009 ES to just over two whimbrel per year (initially). This is in a population where, on average, approximately 108 adult whimbrel die annually due to existing causes.

VEP decided that further turbine removals would not be justified for the limited improvements that would be gained. However, the proposed turbine removals primarily to benefit whimbrel would also benefit other birds, in particular Arctic skua; a species that shows strong association with whimbrel.

VEP set a secondary objective for whimbrel that the Habitat Management Plan (HMP) should implement beneficial habitat management on a high proportion of the



Mainland Shetland whimbrel hot spots. Proposed approaches and action to promote whimbrel in Shetland are set out in the HMP, Appendix A10.9.

As part of the HMP, VEP has reached agreements, in principle, with 31 different land owners and crofters covering 89 parcels of land across central and western Mainland suitable for habitat management to benefit whimbrel (and other wader species) for the life of the project. Approximately one third of the UK whimbrel population breed within the areas covered by these in-principle agreements. The scale of the habitat management proposals within the HMP are designed to more than fully offset the predicted negative impacts of the proposed wind farm on whimbrel; indeed, based on realistic assumptions they could lead to widespread population recovery within the life time of the windfarm, at least on Mainland Shetland.

For more on whimbrel see Chapter A11.

More than eight years of study and consideration have been applied to ornithology in relation to the Viking Wind Farm. The knowledge built up during that time gives considerable confidence in the robustness of the assessments. One of the considerations in this Addendum has been to assess impacts on a ‘most likely’ scenario in accordance with all EIA guidance whereas the 2009 ES tended to consider ‘worst case’ scenarios which, when cumulatively applied, gave unrealistic projections. Yet the approach remains conservative and recent material gives confidence that the Addendum errs entirely towards the pessimistic. For example, the recent studies of golden plover displacement disturbance at Farr Wind Farm and Beinn Tharsuinn Wind Farm suggest the numbers of golden plover projected by VEP to be displaced (eight pairs in a regional population of 1,450 pairs) to be perhaps excessive and in disagreement with evidence from these two operational windfarms, which contends there may be no displacement.

Chapter A11 sets out afresh the revised ornithology assessment.

### **A1.3.8 Landscape Character and Visual Impact**

In many cases in the 2009 ES we concluded that the effect of the proposed wind farm on landscape character and visual impact would be “significant”. In general, to reduce this assessment to “not significant” would require the removal of so many turbines as to render the proposed wind farm economically unviable. However, we were able to identify areas where localised improvements were possible, and so an objective was set to maximise the reductions in landscape character and visual impacts by building on changes necessary for other reasons. A priority was given to changes that would reduce the assessment for individual landscape character areas.

For example, eight turbines were removed in the north-east ‘Laxo to Collafirth’ area of the 2009 ES layout. Five of these removals were necessary to meet ornithological concerns, and also gave valuable reductions to ecological impacts and improvements to the carbon payback calculations. Landscape character and visual impact improvements were also achieved. The removal of the remaining three turbines would not have been justified for ornithological, ecological or carbon payback reasons alone. However, clearing the north-east section of the site entirely was considered to achieve tangible landscape and visual improvements.

Similarly, several turbines in Delting were removed to reduce potential impacts on aviation and archaeology leaving one turbine isolated from the remaining development. Removing

this turbine would lead to only marginal benefits for ornithology and other aspects. However, by removing it we were able to reduce visual impacts to nearby residences..

Turbines were removed near Nesting for ornithological reasons. The ornithological benefits could have been achieved in at least two different ways, but the choice was made to remove turbines nearest to Nesting as that option also helped to reduce visual impacts. The removal of different turbines to achieve the same ornithological benefits would not have achieved the same visual impact benefits.

Effects on landscape character are considered further in Chapter A8. Effects on visual impact are considered further in Chapter A9.

### **A1.3.9 Ecology**

Avian and non-avian ecology are closely linked in rather obvious ways, although dealt with separately in the 2009 ES and in this Addendum.

To reflect consultation responses the Habitat Management Plan (HMP) has been expanded and targeted at specific key issues, namely ornithology (especially key species of whimbrel, merlin and red-throated diver) and ecology (blanket bog). SNH's recommended conditions in respect of Sandwater SSSI were also adopted in the Addendum.

The HMP has been extensively redesigned and extended and is primarily concerned with ensuring that predicted wind farm impacts are reduced to such an extent that favourable conservation status is not significantly affected for the species and habitats under consideration (as per SNH 2006 guidance).

The HMP also includes a number of measures that go beyond merely offsetting predicted wind farm impacts. In fact they are intended to further the conservation of the three priority bird species and one priority habitat.

The HMP targets more than the necessary mitigation levels. For example, the unmitigated assessment of impacts to red-throated divers concludes that collision mortality resulting from the proposed wind farm would be less than two breeding birds per year (initially). VEP would target and work towards regular breeding by divers on at least five new sites, i.e. sites with no recent history of regular breeding. If wholly successful this benefit would exceed the predicted negative impact. Therefore only one of five separate efforts need be successful to achieve intended benefits.

Early versions of the HMP were discussed with stakeholders. These discussions covered the potential style and content of the documents as well as how to demonstrate the confidence levels applied when allocating benefits arising from the HMP to assessments.

In order to demonstrate the ability to deliver HMP activities, investigation was undertaken into the forms of contract for land management agreements adopted by varying environmental schemes. This involved dialogue with, for example, SNH and the Scottish Executive Environment Directorate. This investigation concluded that such agreements were possible and there was clear advice that the Scottish Agricultural College (SAC) would be the most appropriate body to liaise with over the size and nature of payments and details of contracts.

As it would be impractical and unreasonable to enter immediately into formal binding 20-year land management contracts merely to demonstrate an ability to deliver, it was concluded that the most appropriate alternative would be to approach landowners and crofters to:

- 1) Give a high level view of what activities could potentially be introduced on their ground;
- 2) seek agreement for their co-operation in a process of initial baseline monitoring;
- 3) seek in-principle agreement to their participation in negotiations that could lead to a 20 year land management contract with suitable incentives (to be calculated in consultation with SAC).

The results of these approaches are presented in the HMP and in the relevant sections of the ornithology chapter, Chapter A11.

#### Peatland

The wind farm as proposed in 2009 would have had a significantly beneficial effect on the peatland environment, because the proposals included stopping up drainage ditches and erosion gullies, reducing sheep grazing intensity, restoring upland lochans, designing the road system to help peat hydrology by impeding surface drainage (where possible) and managing large areas for nature conservation purposes, and other measures.

This 2010 Addendum proposes more, similar measures, implemented through the HMP, and includes in-principle agreement with the land owners and crofters concerned where proposed blanket bog management measures could be undertaken over the life of the project. If successful, these mitigation measures would more than compensate for any negative effects predicted as a consequence of the development. Subject to further land agreements, successful measures could then be repeated across the development site, potentially addressing the widespread peat erosion which exists across much of the proposed development area.

Ecology is considered further in Chapter A10

The revised HMP is presented with this ES Addendum as Appendix A10.9.

#### **A1.3.10 Carbon payback**

The 2009 ES contained a drafting error where a provisional figure based on estimated peat volumes was used for a summary chapter but was not then later amended in the summary when the proper figure became available. This caused confusion for many reading the ES.

As a result of wind farm redesign a number of the input parameters to the carbon payback calculation have changed. In particular, reduction in the size of the proposed wind farm has led to a reduction in the volume of peat requiring extraction for infrastructure, and the Habitat Management Plan was heavily revised. It was also recognised that whilst the 2009 ES provided a highly conservative estimate of carbon emissions, it was at odds with the evidence presented in other ES chapters, particularly ecology and soils, in that the carbon emission calculations assumed pristine existing peat across the development site. This presented both an unrealistic and overly pessimistic evaluation of the carbon payback, because the existing peat is, in many areas, in very poor (and declining) condition.

The extent of drainage effects on peat is a critical parameter in assessing disturbance to peat and hence carbon emissions. The 2009 ES used the default drainage distance scenarios offered by the model. VEP considered the findings of various studies and data and found that the 2009 ES assumptions were overly conservative. For the Addendum an approach of using a low extent drainage scenario of 10m, an intermediate (most likely) drainage scenario of 20m and a high extent drainage scenario of 50m was used.

In reaction to many queries regarding the carbon balance calculations VEP set a further objective to present a more robust explanation of the subject and assessments. To reinforce the content of the assessments, VEP arranged for The Macaulay Land Use Research Institute to undertake an independent review of the carbon payback calculations on behalf of Viking Energy with the aim of improving both the robustness of these calculations, and to inform further assessments based upon them.

The revised methodology and input parameters are explained in more detail in Chapter A16.

#### **A1.3.11 Noise**

No substantive objections to the proposed wind farm were based on noise impacts; and most of the 2010 changes to the design result in reduced predicted noise impacts, whether because of turbines and tracks being deleted, construction activity being less, or the number of borrow pits (quarries) being reduced. No changes to the design would result in any increased noise impacts.

Updated guidance on best practice for assessing wind farm noise was provided in the Institute of Acoustics (IOA) “Acoustics Bulletin” published in March/April 2009. This guidance was released after the noise assessment for the 2009 ES had been concluded. The IOA best practice provides a common approach in assumptions used in calculating noise propagation and also, more crucially, sets out an agreed method for treating wind shear i.e. the variation in wind speed with height above ground level. Wind shear is important because noise from wind turbines is usually generated at the top of the towers where the wind may be stronger than experienced at ground level, which is where most receptors are.

In order to comply with the new best practice it was necessary to undertake revised background noise monitoring at receptor locations; this was undertaken in the early part of 2010. The revised assessment considers the new background monitoring data and the effects of wind shear on measured values.

Updated guidance on the assessment of construction noise effects was released following submission of the 2009 ES but has no implications for the method used in the 2009 ES. Re-assessment of the effects of construction noise was however required due to revisions to the number and location of borrow pit search areas. Shetland Islands Council Environmental Health service had raised concern that some receptors would be subject to noise from multiple borrow pits either worked simultaneously or consecutively. Alterations to borrow pit locations in the revised 2010 Viking Wind Farm layout have resulted in no receptor being within 1 km of more than a single borrow pit search area.

Noise is considered further in Chapter A12.

#### **A1.3.12 Aviation**

The owners and operators of Scatsta Airport objected to the 2009 ES.

An objective was set to continue discussions with the owners and operators of the airport, to clarify potential impacts at Scatsta Airport and to mitigate known issues. A further objective was set for this Addendum to reflect the latest status of any ongoing process.

VEP agreed to remove turbines confirmed as impacting upon the existing landing aides.

Unlike most other subjects, the aviation concerns raised by Scatsta are an ongoing matter. Proposals to upgrade the airport complicate efforts to find mitigations for issues. As a

result of the redevelopment of Scatsta there are some unknowns regarding landing procedures which potentially impact upon some of the remaining proposed turbines. Until further work is completed involving the airport and the aviation authorities, the exact impacts cannot be confirmed. These outcomes would inform what further mitigation may be required. The eventual mitigations would range from moving turbines or helping with the installation of alternative landing aides, to the complete removal of particular turbines.

Aviation is considered further in Chapter A18.

### **A1.3.13 Construction management**

SEPA requested more clarity on the storage and re-use of peat.

An objective was set for the redesign to address as many of the detailed construction process comments as possible and to comply with any guidance arising from the SNH-led workshops or resultant reports. A further objective was set for the Addendum to explain where peat arising from the works would be moved, stored and re-used and how those proposals comply with relevant waste legislation.

The main activity undertaken has been the development of the Site Environmental Management Plan (SEMP). This replaces and consolidates several previous equivalent documents. The content of the SEMP, including waste management prescriptions and peat use intentions, have been discussed with SEPA. In all cases the design amendments have sought to minimise the amount of peat disturbed before considering how materials arising from the works might be managed.

Double width tracks would be reinstated to single width following the construction phase. This redesign decision provides an improvement for landscape and visual impacts. It also requires a considerable volume of peat. Revised assessments for borrow pits and peat volumes were produced.

Borrow pits are considered further in Chapters A4 and A14.

Peat volumes are considered further in Appendix A14.4.

The Site Environmental Management Plan is presented in Appendix A14.6.

**Table A1.2 Objections received from Statutory Consultees and RSPB, and VEP responses**

The table below lists the *objections* to the 2009 Viking wind farm received from statutory consultees (and, due to the importance of bird issues, the RSPB); briefly describes how they have been dealt with by the design team; and explains where to read further information in this ES Addendum. An expanded table including consultees' *comments* and *requested conditions* is provided at Appendix A1.1.

Ref	Summary of objection	Response
<b>Historic Scotland - Cultural Heritage</b>		
HS1	Predicted significant impact on setting of eight scheduled monuments (Burravoe chambered cairn (cc); Graven cc; Knowe of Bruland cairn; Hayfield cc; Crooksetter Hill cc SE; Crooksetter Hill cc NW; Skeo of Gossaford cc; and Hill of Dale cc) assessed as unacceptable in terms of national policy for the protection of the historic environment. Hill of Dale cc close to search area for borrow pits and tracks.	Significant further consultation has taken place with HS and with Shetland Amenity Trust (SAT); turbines have been deleted due to setting impacts on Cultural Heritage; and a revised and expanded Archaeological Management Plan and Heritage Strategy have been developed. See Chapter A13.
<b>SEPA - Water ecology, waste and decommissioning</b>		
SEP 4.6.5a	Siltation from development a major problem for aquatic life. Particular concern regarding sediment impacts on lochs. SEPA object due to lack of information on potential impact of sedimentation.	Extensive further consultation has been entered into with SEPA. Appendix A14.6, the Site Environmental Management Plan (SEMP), has been re-written and expanded and now provides further information and commitments on how construction activities would be managed to protect the environment.
SEP 9.3	Objection until worst case scenario for peat volume extraction is calculated.	The volume of peat which would be excavated is now less than that which would have been required in the 2009 design. Extensive further consultation with SEPA has resulted in revised estimates which are presented in Appendix A14.4, Estimated Peat Extraction Volume and Intended Reuse Options.
SEP 9.4	Objection until firmer conclusions reached regarding [peat] storage, re-use and disposal options.	Appendix A14.4 deals with storage, re-use and disposal. The Site Environmental Management Plan (SEMP), Appendix A14.6, has been re-written and expanded and now provides further information and commitments on how construction activities would be managed to protect the environment.

SEP 11.2	Object until further principles of proposals for decommissioning and aftercare submitted. To include plan showing elements removed/left in situ.	Developed proposals for decommissioning are contained within the re-written and expanded SEMP, Appendix A14.6 TS7. Turbines would be removed but bases left <i>in situ</i> , and the ground surface reinstated with peat. In general, tracks, cable trenches and other structures would be left <i>in situ</i> . To remove them would cause unacceptable ground disturbance and risk of pollution and siltation. A plan is not thought appropriate at this stage because any variation to this general strategy would be determined on a case-by-case basis nearer to the time of decommissioning, depending on the requirements of landowners, the planning authority and other relevant stakeholders at the time.
<b>SNH - Designated sites, birds, landscape character and visual impact</b>		
SNH 2.1	Inadequate consideration of likely adverse effects on Sandwater SSSI and lack of proposed mitigation regarding works outwith development boundary.	The proposed improvements to the B9075 north of Sand Water would now all take place on the north side of the road, and a commitment to this effect is given in Chapter A15, Roads and Traffic. A number of works may be required outwith the development boundary, in particular improvements to road structures and junctions to enable the movement of abnormal loads, and a commitment is given to the effect that all such works would be carried out in full consultation with the Highway Authority and in accordance with normal standards, including the Design Manual for Roads and Bridges (DMRB). All such works would be relatively minor, and comparable with normal maintenance activities on the public road network.
SNH 2.3a	Magnitude of predicted impacts on red-throated diver, merlin, golden plover, dunlin, whimbrel, Arctic skua, lapwing, curlew and great skua.	Survey and analysis work has continued through 2009 and 2010 breeding seasons, and a significant number of turbines have been deleted from the 2009 design due to predicted impacts on birds. A great deal of additional consultation has taken place with both SNH and RSPB. More information has been provided and assessment methods have been improved. Please see Chapter A11 and Appendix A10.9 (Habitat Management Plan).
SNH 2.3b	Likely long term impacts on Favourable Conservation Status (FCS) of merlin, golden plover, dunlin, Arctic skua, lapwing, curlew and great skua at Regional level.	Please see response to SNH 2.3a above.

SNH 2.3c	Likely long term impacts upon FCS of whimbrel and red-throated diver at Regional and National levels.	Please see response to SNH 2.3a above.
SNH LS P1/ILCC 7.10	Current proposal exceeds landscape capacity with significant adverse effects on visual amenity. SNH objects to current proposal unless appropriate modifications can be made.	A number of turbines have been deleted on landscape character and visual impact grounds, and deletions of other turbines for other reasons also help to reduce the residual impact.
<b>RSPB - Birds, habitats and planning</b>		
RSP S1	Unacceptable damage to regional/UK populations of numerous bird species. Potential adverse impacts on red-throated diver, merlin, golden plover, lapwing, dunlin, whimbrel, curlew, Arctic skua and great skua unacceptably high. Operational disturbance and risk of collision with turbine blades likely to have significant adverse effects on Shetland populations. Development likely to adversely affect UK populations of whimbrel and Arctic skua.	Please see response to SNH 2.3a above.
(RSPB also objected on the grounds of damage to blanket bog, uncertain carbon balance and conflict with planning policy.)		