


TECHNICAL APPENDIX 14.6 VIKING WIND FARM ADDENDUM ENVIRONMENTAL STATEMENT		 <b>viking energy</b> Harnessing Shetland's natural resources
SITE ENVIRONMENTAL MANAGEMENT PLAN TECHNICAL SCHEDULE No. 8 ECOLOGICAL (HABITAT AND SPECIES PROTECTION PLAN)		
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# SITE ENVIRONMENTAL MANAGEMENT PLAN


## VIKING WIND FARM

### TECHNICAL SCHEDULE 8

## ECOLOGICAL (HABITAT AND SPECIES) PROTECTION PLAN


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# 1 INTRODUCTION

## 1.1 Scope and Objectives

- 1.1.1 The information here forms Technical Schedule 8 (TS8) Ecological (Habitat and Species) Protection Plan (EPP), of the Viking Wind Farm Site Environmental Management Plan (SEMP). The SEMP, including the information and measures contained within this plan, form part of the Contract and will be made available to those tendering for construction works. The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, shall be adhered to by the appointed *Contractor* in developing the detailed design of the wind farm and in development of the construction method statements and other plans relating to environmental management as required by the Contract.
- 1.1.2 The objective of this Ecological (Habitat and Species) Protection Plan is to ensure compliance with these policy objectives, as well as current environmental legislation, and to provide a benchmark for best practice such that all possible preventative measures will be taken to avoid harm to the terrestrial and aquatic habitats of the Viking site area and the species they support, together with downstream ecosystems, both during construction works and during the operational phase of the wind farm.
- 1.1.3 Implementation and monitoring of this Habitat and Species Protection Plan will be the responsibility of the Viking's Environmental/Ecological Clerk of Works (ECoW), appointed by Viking Energy Partnership. The ECoW will be a qualified ecologist and environmental scientist, a Member of the Institute of Ecology and Environmental Management, and be approved by Shetland Islands Council and Scottish Natural Heritage after submission of details of qualifications and experience. The role and duties of the ECoW are given in detail in Section 3 of the SEMP, and further details are also provided in Section 2 of this document.
- 1.1.4 This Ecological (Habitat and Species) Protection Plan should be read and implemented on site in conjunction with the requirements of other documents as contained / specified within the SEMP and its associated Technical Schedules (TS), plus site documentation on species and habitats within environmental statements and mitigation proposals for habitat management (including the Viking Wind Farm Environmental Statement, Addendum and Planning Statement).


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## 1.2 Definitions, coverage and scope

- 1.2.1 Species protection may be defined as the set of measures used to minimise the risk of disturbance, injury or death to species of nature conservation interest. Particular attention is paid to species protected under EC and/or UK legislation.
- 1.2.2 Habitat protection may be defined as the set of measures used to minimise the risk of damage or destruction to the terrestrial and aquatic habitats of the site and downstream ecosystems.
- 1.2.3 A two-tier approach is to be applied to species protection:
1. Formal species protection plans will be applied to species present on site which are protected by EC and/or UK legislation and which are considered at risk from development: e.g. Otter.
  2. Other species which are known to be present, or are possibly present, but which have not been found within or close to the ground to be developed, or close to watercourses, will not have a species protection plan. Instead, mitigation measures used for Otter, plus other environmental protection measures will be used to ensure other species are not affected. These measures include surveys of the development corridor and water courses in advance of construction and during construction. If evidence is found that other species are at risk, a species protection plan will be implemented.
- 1.2.4 Note that the evidence for Otter relates only to fresh spraint, evidence of recent use. No holts were found. Only two sites, both containing only 'remains' (in the quadrant area of Nesting), were found within the area potentially 'disturbed' by the proposed physical development. The lack of evidence of otter presence recorded during the survey suggests the population is not widely dispersed throughout the Viking study area, and, therefore, it is assumed to be at a relatively low density.
- 1.2.5 Other species such as breeding birds will also require protection.

### Habitats to be protected and enhanced

- 1.2.6 Healthy species populations require appropriate habitats. Impacts upon habitats have direct and indirect effects upon species. The key habitat types present at the Viking site are therefore identified in this document, on the basis of information in the Environmental Statement and Addendum thereof, the Planning Statement and Habitat Management Plan (HMP) documents.
- 1.2.7 Habitat enhancement may be defined as the measures to modify the distribution and improve the condition of habitats, as set out in the HMP.
- 1.2.8 The following important habitats have been identified within the development area, and will be the subject of formal protection measures during the construction phase of the wind farm and improved management under the HMP:
- *Sphagnum* blanket bog
  - Lochans
  - Rivers and streams
  - Wet grassland communities

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1.2.9 The aquatic habitats and aquatic life within the development area watercourses will be protected using measures in detailed site-specific Construction Method Statements and other components of the Site Environmental Management Plan. Protection will include fish within those watercourses and further downstream.

1.2.10 The habitat protection measures covering terrestrial and aquatic habitats are given in Section 4 herein.

### Species: Birds to be protected

1.2.11 All bird species (apart from a few “pest” and game species) are protected by law, under the Wildlife and Countryside Act 1981 (Appendix 1), so that it is an offence to kill them or damage their nests and eggs. Species listed in Schedule 1 of the Act are specially protected, so that it is an offence merely to disturb them while nesting. Other specially protected species are listed on Annex 1 of the EC Birds Directive, which also prohibits willful disturbance at the nest. However, if disturbance to the nest of any other bird species without special protection were sufficient to prevent parent birds from incubating their eggs or feeding their nestlings, so that the brood died, this could be regarded as an offence under the 1981 Act.

1.2.12 Accordingly, all breeding birds likely to use the development area will be protected.

1.2.13 The bird protection measures are given in Section 3 herein.

1.2.14 Habitat enhancement measures and mitigation management for several species of bird are included under the HMP. These measures are unlikely to affect wind farm work in the construction and operation phases of the wind farm and are not considered further in this document.


### Species: Mammals to be protected

1.2.15 The following mammal species protected under UK and/or EC legislation are recorded as present within the wind farm development area and as using the watercourses downstream of the development:

- Otter

1.2.16 **Otter** The Otter is a species of European importance, protected under Regulation 39 of the Conservation (Natural Habitats, & etc.) Regulations 1994 (as amended). Under these regulations it is an offence to; deliberately or recklessly kill, injure or capture an Otter; deliberately or recklessly disturb or harass an Otter; and to, damage, destroy or obstruct access to a breeding site or resting place of an Otter (i.e. an Otter shelter). A licence is required for all developments which will affect areas known to contain Otter shelters. This licence is issued by the Scottish Government, in consultation with SNH. The Otter is also fully protected by the Wildlife and Countryside Act (1981, as amended) and the Nature Conservation (Scotland) Act (2004). Note, SNH (letter 24 June 2009) advised against applying for an Otter EPS licence as a precautionary measure as they noted the survey results showed that the proposal was not likely to result in actions contrary to the species protection elements of the Conservation (Natural Habitats &c) Regulations 1994, as amended.

1.2.17 The mammal protection measures are given in Section 3 herein.

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### Potential sources of harm to habitats and species

- 1.2.18 A very wide range of activities have the potential to cause harm to habitats and species. An outline of activities is given in Table 1 below.
- 1.2.19 Potentially harmful activities which will occur during the pre-construction, construction, operation, decommissioning and restoration phases of wind farm development are highlighted in grey in Table 1. As a simple example, disturbance, injury or death can arise from the introduction of a contaminant into air, land or water, resulting in an impact (generally negative) to the ecosystem into which the substance is released. Silt-laden waters can destroy or harm most aquatic life if the receiving watercourse was high quality before development. Loss of fish and fish spawning grounds reduces food for Otter and recreational use for fishing.
- 1.2.20 Careful planning of activities, followed by implementing best practice methods which include appropriate mitigation and monitoring at all stages of an operation, together will avoid or minimise negative effects.
- 1.2.21 The ES and PS documents have estimated the levels of negative impact which will occur and concluded these will be small and of low significance as residual effects. The ES and PS documents have assumed, as part of calculating residual effects, that best practice methods will be used at all times.
- 1.2.22 **Good construction practice and appropriate mitigation and monitoring are therefore essential for the protection of habitats and species during construction and operation of the wind farm.**
- 1.2.23 An additional aim of this Ecological (Habitat and Species) Protection Plan is to keep effects within the predictions of those documents, or to make them smaller. Measures within the HMP aim to improve the habitats and key species on the Viking site, offsetting the effects of the development.

**Table 1 - Activities with the potential to damage habitats and disturb, injure or kill plant or animal species**

Source: Adapted from IEEM (2006) Guidelines for Ecological Impact Assessment in the United Kingdom. Institute of Ecology and Environmental Management, Winchester.

**Preliminary activities prior to the main construction contract**

(e.g. ground investigations)

**Construction phase**

- Access and travel on/off-site.
- Assembly areas for components of construction.
- Blasting, e.g. for minerals operations.
- Construction of structures and hard surfaces.
- Demolition operations.
- Environmental incidents and accidents (e.g. spillages, noise and emissions).
- Fires.
- Ground and excavation works.
- Lighting.
- Provision of services and utilities (e.g. underground power lines, water supply and drainage).
- Removal or disruption of top-soil/sub-soil etc.
- Siting and subsequent removal of site offices/compounds and final site clear away after construction.
- Storage areas for construction materials.
- Structural works for building and engineering.
- Structural works to existing buildings, including conversions.
- Temporary access routes for construction vehicles - both on and offsite.
- Vegetation clearance.

**Occupation/Operational phase**

- Access (both route and means).
- Drainage.
- Damage to mitigation work through accident or vandalism.
- Implementation of landscape design and habitat management (type and location).
- Presence of people, vehicles and typical uses and activities (including factors likely to cause disturbance, e.g. on-site monitoring, increased public access and recreational pressure, risk of fires, lighting, noise, regular emissions).
- Presence of pets and working dogs.
- Site operation and management (e.g. maintenance operations, industrial processes generating emissions, etc.).

**Decommissioning phase**


- Removal of contaminated water or soil.
- Removal or demolition of disused structures that may have been colonised by, e.g. roosting bats, barn owls.
- Removal of ancillary developments including culverts.
- Removal or neglect of structures which might cause pollution if they fail.

**Restoration phase**

(where operations/phases have finished, e.g. for mineral extractions).


**Potential unexpected events**

(e.g. other one-off incidents and accidents such as peat instability).

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1.2.24 Works may be suspended at the request of the Employer, ECoW, SEPA, SNH or HSE at any time when a potential risk to habitats and species is identified (and resulting harm may be caused to land, water, protected species or human health) or where construction methods and mitigation measures relating to site ecology (habitats and species) are not as specified within the construction method statements and relevant plans as submitted and agreed at the commencement of the works.



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## 2 THE ENVIRONMENTAL/ECOLOGICAL CLERK OF WORKS

### 2.1 Background

- 2.1.1 The Employer will appoint an appropriately qualified Environmental/Ecological Clerk of Works (ECoW), who will be named to and approved by the planning authority and SNH. This person(s) will be known as the Viking Wind Farm ECoW. The ECoW must be a member of the Institute of Ecology and Environmental Management (IEEM).
- 2.1.2 As the delivery of this Ecological Protection Plan is highly dependent on the roles and responsibilities of the ECoW, at least during the construction phase of the development, some detail is provided here regarding this position.


### 2.2 Term of appointment

- 2.2.1 The ECoW will be a full time post, and will be on site for 4.5-5 days per week during the main construction period. Some office time is required for reporting.

### 2.3 ECoW tasks

#### Overview

- 2.3.1 There are no statutory conservation designations within the area where the proposed physical development will actually take place. However, there are two nature conservation designated sites within the wider Viking study area: The Burn of Lunklet SSSI (1.4ha designated for endemic hawkweed species) and the Kergord plantations SSSI (6.45ha designated for broadleaved, mixed and conifer woodlands).
- 2.3.2 Although not directly affected by the wind farm itself or associated infrastructure within the development boundary, the Sand Water SSSI is likely to be adversely affected by other associated works out with the development boundary.
- 2.3.3 All works within 500m of any designated site, or within 500m of any tributary water courses or other direct pathways to a designated site, will be undertaken in strict accordance with the pollution prevention principles contained within this SEMP.
- 2.3.4 In particular, the following mitigation is required to address potential issues that may be associated with the construction compound and road upgrades within the Sand Water SSSI catchment:
- road alterations must take place on the north side of the existing B9075, so that the works do not encroach into the SSSI;
  - construction methods, pollution prevention measures and details of water crossings and culverting to be fully agreed with SEPA, and ultimately implemented and controlled by the Ecological Clerk of Works;
  - toilet, washroom and kitchen facilities for workers at the construction compound, near to Sand Water, to be in the form of sealed units which are regularly maintained and emptied to ensure no waste water spills from them.

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- 2.3.5 The Viking Wind Farm development is located in an area of sensitive habitats which support known protected species. The wind farm area is likely to experience a range of environmental and ecological issues associated with its construction. The ECoW will advise and assist in avoiding, minimising and mitigating adverse effects. The ECoW will document effects and relate them to predicted residual effects specified in ES documents at the end of the construction period.
- 2.3.6 The following are anticipated to represent the main tasks which translate these aspects of the role into action. This list is not intended to be exhaustive, and will require modification during the construction period as and when circumstances dictate.

### Micrositing

- 2.3.7 Movement of turbines and associated tracks within micrositing allowances, to take account of environmental considerations, in consultation with the Geotechnical Clerk of Works (GCoW) and Archaeological Clerk of Works (ACoW) as necessary.


### Pollution Prevention Plan

- 2.3.8 Review, agreement and approval of contractor's Pollution Prevention Plan prior to commencement of work.
- 2.3.9 Conduct weekly inspection of site pollution prevention measures (straw bales, silt traps etc.) and visually assess their effectiveness. This will include inspection of water management measures installed by contractors such as excavation pumping and diversion channels, as well as the containment of silt away from watercourses and advice on micro-siting of mitigation measures.
- 2.3.10 Maintain a Pollution Prevention Measures Register of the weekly inspections, to include an inventory of all measures on the site, their effectiveness, as well as any advice provided.
- 2.3.11 Collation of water sampling results (collected and analysed by third parties) for presentation in monthly reports (see below).
- 2.3.12 Suspension of work where potential risk from pollution is identified, or where construction methods and mitigation measures are not as specified in construction method statements and/or plans as agreed at commencement of works.
- 2.3.13 Provide advice and recommendations to Viking Energy Partnership and its contractors regarding the above.

### Waste management

- 2.3.14 Review, agreement and approval of the *Contractor's* Site Waste Management Plan
- 2.3.15 Review of the *Contractor's* records for all inspections of fuel, oil or chemical storage areas, including the integrity of storage facilities.

### Drainage Management

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2.3.16 Review, agreement and approval of the *Contractor's* Site Drainage Management Plan.

2.3.17 Inspection of drainage management works.

2.3.18 Liaison with Planning Monitoring Officer inspecting works on behalf of the local authority.

2.3.19 Agreement of monitoring standards to be applied by contractor's personnel.

2.3.20 Assessment in advance of habitats and species for ground to be affected by drainage management.

2.3.21 Review of the *Contractor's* records for plant inspections, evidence of contamination and checks made after extreme weather conditions.

2.3.22 Liaison, field discussion and agreement of drainage management works with SEPA and/or SNH, when required by consultees and when considered necessary by ECoW.

2.3.23 Agreement of frequency and location of drainage ducts installed beneath floating roads.

2.3.24 Agreement of drainage management associated with temporary peat storage and reinstatement works in advance of such works commencing.

### **Watercourse Crossings**

2.3.25 Review, agreement and approval of the *Contractor's* Site Watercourse Crossing Plan.

2.3.26 Survey in advance of watercourse condition and protected mammals for all ditch and stream crossings, using an established specialist if necessary.

2.3.27 Review of the *Contractor's* records for plant inspections, evidence of contamination and checks made after extreme weather conditions.


### **Water Quality Monitoring**

2.3.28 Review, agreement and approval of the *Contractor's* and independent Site Water Quality Monitoring Plans where undertaken.


2.3.29 Inspection of contractor's records for water environment monitoring and comparison of those records with independent records.

2.3.30 Presentation of independent water environment monitoring results at weekly and monthly site meetings.

### **Excavated materials and reinstatement**

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- 2.3.31 Review, agreement and approval of the *Contractor's* Site Excavated Materials and Reinstatement Plan.
- 2.3.32 Marking working areas and route corridors, in consultation with GCoW and/or ACoW as necessary.
- 2.3.33 Granting permission to work off hard ground using low ground pressure machines, including specification of the points of entry and return, and the route to be taken.
- 2.3.34 Micrositing of wind farm infrastructure to avoid unstable ground, avoid unsuitable foundations, minimise ground disturbance and excavation volumes (especially of peat), adverse impacts on watercourses, sensitive habitats, species or cultural heritage, in consultation with GCoW and/or ACoW as necessary.
- 2.3.35 Agreeing proposals for side casting and temporary storage areas as development proceeds.
- 2.3.36 Agreeing timing of restoration and reinstatement of track sides.
- 2.3.37 Monitoring the condition of stored turf.
- 2.3.38 Agreeing any required hydroseeding specification, including seed mix and fertiliser quantities.
- 2.3.39 Agreeing specification for borrow pit restoration.
- 2.3.40 Agreeing specification for survey and 'as built' information of each borrow pit after completion of initial restoration.
- 2.3.41 Issuing instruction to cease work if unexpected risks arise, until an agreed alternative solution is identified and risks are avoided or minimised.


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### Ecological Protection Tasks

- 2.3.42 Review, agreement and approval of the *Contractor's* Ecological (Habitat and Species) Protection Plan.
- 2.3.43 Erection and maintenance of markers and notices for limits around watercourses and other areas with protected species or habitats.
- 2.3.44 Consideration of requests and granting of permission to enter within habitat and protected species exclusion zones.
- 2.3.45 Conduct weekly checks for protected species within and adjacent to construction areas, particularly covering Otter.
- 2.3.46 Check ground ahead of the likely construction and felling front for species (Otter).
- 2.3.47 Recommend implementation of the terms of specific protection plans (e.g. Otter) as and when required.
- 2.3.48 Implementation of species protection plans if ground checks suggest this is necessary for the following: Otter, breeding birds.
- 2.3.49 Execution of the terms of any Licence to Disturb Otters which might be required as a result of future surveys and searches.
- 2.3.50 Maintain a register of faunal sightings/signs for the site, within a GIS.
- 2.3.51 Conduct weekly checks of sensitive habitat (peatland, watercourses) within the proposed areas of felling and construction.
- 2.3.52 Implement the Terrestrial Habitat Protection Plan and Freshwater Habitat Protection Plan, including surveys and checks specific to those plans.
- 2.3.53 Maintain a register of all habitat inspections carried out.
- 2.3.54 Provide advice and recommendations to Viking Energy Partnership and its contractors regarding the above and where appropriate provide advice on aspects of implementation of the Habitat Management Plan for the site.

### Recording

- 2.3.55 The ECoW will keep a record of the following:
- notable animal sightings and signs (including birds, in addition to other site ornithological monitoring), particularly those noted in searches one or two days in advance of construction;
  - the Pollution Prevention Measures Register (as detailed above);
  - the habitats and soil (including peat depth) of ground to be developed via survey at least a week in advance of construction work;
  - record of tasks carried out;

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- written record of all oral advice given.

2.3.56 The ECoW will maintain a GIS database of key recordings made during the construction period. Field records will use, if necessary, differential GPS technology captured into a field GIS system.

2.3.57 The hard copy registers will be made available for all personnel on site to consult. Access to GIS records will also be made available, but under the supervision of the ECoW.

### **Environmental Management Group**

2.3.58 Attend and minute weekly and monthly meeting of an Environmental Management Group (or equivalent) which will include representatives from Viking Energy Partnership and its main Contractor. The purpose of the group will be to:

- review the construction progress on site in the context of ecological and environmental mitigation;
- review the effectiveness of the ecological and environmental mitigation;
- discuss construction programme for the following week, and fortnight look-ahead;
- agree actions on these matters;
- agree items for discussion at monthly Project Meetings.
- Liaise with any wider external environmental advisory groups (e.g. Shetland Windfarm Environmental Advisory Group (SWEAG)).

### **On-site communication**


2.3.59 The success of ECoW appointments is largely dependent on well-defined lines of communication. In theory, robust construction method statements will incorporate many of the areas of ECoW concern into the daily activities of construction personnel. However, the ECoW will always inform the Viking Energy Partnership Project Manager of areas of particular concern, who will then make a decision as to the subsequent action.

2.3.60 The ECoW will be involved in the delivery of biodiversity-related Toolbox Talks as part of the site induction process. All staff will know of the circumstances when the ECoW should be contacted, and the relevant phone numbers.

### **Liaison with consultees**

2.3.61 The ECoW will provide a liaison between SNH, Shetland Islands Council and SEPA if this is required. In addition, the ECoW will liaise with wider external advisory groups such as SWEAG where required.

### **Monthly reports**

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2.3.62 The ECoW will produce a monthly report detailing the above activities.

2.3.63 The report will also contain water sampling analysis results, if these are available.

2.3.64 The ECoW will also assist Viking Energy Partnership with the supply of relevant information for compliance assessment.

### **Final Report**

2.3.65 The ECoW will produce a final report to Viking Energy Partnership documenting the environmental and ecological effects of the construction period. The evidence for effects will be based on findings included in the minutes of weekly meetings and monthly meetings, together with other recording information maintained by the ECoW. The report will relate results to residual effects predicted in Viking ES documents. The report will be made available to the Contractor, Shetland Island Council, SNH, SEPA and other external agencies where appropriate (e.g SWEAG).

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### 3 SPECIES PROTECTION PLANS

#### 3.1 Deciding species requiring protection

3.1.1 Surveys for environmental statements and confirmatory work for ES findings show the following species of interest in the Viking area.

3.1.2 **Otter:** Otter is protected under the EC Habitats and Species Directive, which is transposed into UK law by the Conservation (Natural Habitats &c) Regulations (as amended in Scotland 2007) 1994. The evidence for Otter relates only to fresh spraint, evidence of recent use. No holts were found, although this may be attributed to seasonal breeding. Only two sites, both containing only 'remains' (in the quadrant area of Nesting), were found within the area potentially 'disturbed' by the proposed physical development. However, the implementation of an otter protection plan should be considered for the development.

3.1.3 **Birds:** Breeding bird surveys have shown the area of development contains nesting birds in the breeding season.

#### 3.2 Otter Protection Plan

3.2.1 The Otter protection plan is required to safeguard the Otter interest during the construction period of the Viking Wind Farm. This plan should be used for the induction of relevant site personnel and as a management tool for on-going Otter protection.

3.2.2 The plan is divided into five sections, covering both pro-active and reactive measures as follows:


- General protection measures;
- Personnel induction;
- Pre-construction checks and monitoring;
- Procedures in the event of discovering an Otter shelter;
- Licensing (if and when required).

#### 3.2.3 General Protection Measures

3.2.3.1 Water Quality Protection Measures:

- The TS2 Pollution Prevention Plan, TS4 Drainage Management Plan, TS5 Watercourse Crossing Plan, TS7 Excavated Materials and Reinstatement Plan and TS9 Environmental Incident and Emergency Response Plan will together put in place water quality measures to ensure the protection of Otters. These plans will prevent contamination of watercourses and will protect Otter, other species, aquatic habitats and habitats close to watercourses. There will be daily visual inspections of watercourses for pollution, and independent monitoring of water quality at agreed locations (TS6 Water Quality Monitoring Plan);
- The above measures include mitigation to reduce the risk of pollution of water courses from fuel and silt contamination, effects which can result directly in death, impaired



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reproduction, impaired immunity and seriously damaged habitat which may not recover for months or years. The main mitigation in the above measures are as follows:


- Strict adherence to water pollution prevention guidelines throughout the development;
- Chemicals, oils and hazardous materials will be stored securely away from the watercourses. Fuel spilled up-gradient of watercourses will be washed down tracks and into watercourses during periods of rainfall or snow melt. Fuel storage locations and fuelling points will be situated to avoid this, positioned down-gradient if possible and located within bunds. The bunds should exceed fuel drum capacity by a substantial proportion, to allow for the effects of heavy rainfall. Bunds should be cleaned and then drained regularly. Spill kits and drip trays should be compulsory at all fuel or vehicle maintenance locations on site. Oil booms should be situated in all site drainage ditches and silt lagoons where there is a risk of fuel contamination.
- Silt mitigation measures should also be a priority during the construction and post-construction phases of development.
- Pollution prevention measures involving silt will be installed and maintained as appropriate, including silt interception traps, settling lagoons or mobile silt-trapping units (such as Siltbusters or equivalent device), as well as installation of splash boards at watercourse crossing points to prevent contamination from track run-off;
- Spillage contingency kits will be provided in all site vehicles and there will be daily checks for oil and fuel leaks.

#### 3.2.3.2 Measures to Minimise Disturbance and Risk to Otters During Construction Activities:

- All relevant construction drawings and plans should have an indication of Otter shelter presence if it is in the locality (within 100 m). Exact location should not be marked, to maintain confidentiality.
- All open excavations will be ramped to enable easy exit by Otter and other species;
- Culvert pipes stored on site will be capped or if caps are not available, stored vertically, to prevent Otter entrapment;
- Design of any permanent or temporary lighting will be such that it will be directed away from watercourses and will maintain an unlit corridor of 50m either side of watercourses;
- Prohibition of all fires on site which should take account of known Otter interest. Upland habitats are particularly susceptible to fire and, as such, a no smoking policy should be implemented except in designated areas of the site.
- All construction personnel will be provided with an emergency telephone contact for the ECoW.

#### 3.2.3.3 Design of Safe Watercourse Crossings

- All watercourse crossings highlighted will be designed to ensure dry passage of Otter during high flows either by:
  - a) providing a bridge which is large enough to give dry passage along the bank;


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- b) installing a dry mammal culvert adjacent to the normal culvert; or
- c) incorporating a ledge into the bridge or culvert design to allow passage by Otters.
- Watercourse crossings in areas of high Otter activity will incorporate reflectors designed to reflect vehicle headlight beams and provide warning of the vehicle's approach to Otters.
- A site speed limit of 15 mph for all construction traffic will be imposed across the site.

### 3.2.4 Personnel Induction


3.2.4.1 All relevant site personnel will be given an induction by the ECoW. The induction will be in a format of a toolbox talk with the aim of:

- Making personnel aware of legal obligations placed on them in relation to Otter by national and international legislation and by the conditions of any Scottish Government Otter licence or any other licences which may be obtained;
- Making personnel aware of their personal responsibility for ensuring that no infringement of legislation or breach of any licence condition occurs;
- Ensuring personnel are aware of the current status of Otter on site and the locations in which they are likely to be encountered. Emphasise the importance of amphibians (frogs, toads, newts) as the main prey for upland Otter for most of the year and the need to protect the breeding habitats of amphibians (e.g. bog pools) as well as terrestrial habitats (e.g. damp rushy flushes);
- Ensuring personnel have an understanding of key mitigation methods in place for Otter and their responsibility to implement these measures;
- Ensuring personnel understand the procedure to be followed in the event of finding an Otter shelter, a structure suspected to be an Otter shelter, or an Otter;
- Ensuring personnel understand that no person or work is allowed within exclusion zones without prior agreement and/or supervision with an Otter consultant or ECoW and in consultation with SNH and/or under a disturbance licence;
- Ensuring personnel understand the procedure for encountering a dead or injured Otter within site works, away from any known Otter shelter. An injured Otter must be observed from a distance and followed discreetly at a distance if it is moving. A dead Otter must be left undisturbed. The ECoW is to be called to the location immediately. The ECoW will collect the injured or dead Otter. The ECoW will be responsible for ensuring that any injured or dead Otters are handed over to the proper authorities for care, as well as reporting the circumstances to the appropriate authorities.

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### 3.2.5 Pre-Construction Survey, Checks and Monitoring

- 3.2.5.1 Within 4 months prior to commencement of the development on site, a pre-construction Otter survey for Otter holts or resting places within 500m of wind farm infrastructure will be carried out. This will be conducted by a suitably qualified and experienced ecologist. These checks will take place 14 days or less before commencement of construction and will be carried out under conditions of normal water flow. Surveys will not be undertaken during, or after heavy rain or periods of flood.
- 3.2.5.2 If new Otter holts and/or resting places are found, this information will be added to existing Otter information for the site and the ECoW will evaluate all information in relation to construction.
- 3.2.5.3 The ECoW will carry out further checks during the construction period, including checks ahead of the construction front. These checks will involve at least the following:
- Checks 500m upstream and downstream of all new and upgraded watercourse crossings.
- 3.2.5.4 Suspected natal dens should have a minimum exclusion zone of 200m. If site works are likely to come within 100m of a suspected natal den, advice should be taken from an Otter consultant and the exclusion zone should be extended if required. A cessation of works within the exclusion zone may be necessary until the cubs are mobile and this might be up to 6-8 weeks.
- 3.2.5.5 While all pre-construction checks are the responsibility of the ECoW, it is not physically possible or necessary for the ECoW to check all watercourses on site.
- 3.2.5.6 All site personnel will be obliged to report any sightings of Otters and any potential Otter shelters found on site to the ECoW as soon as practicably possible.

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### 3.2.6 Procedures in the event of discovering an Otter shelter

#### Overview

3.2.6.1 Procedure A describes the steps in the event of disturbance of a known Otter shelter. If disturbance to a known Otter shelter occurs, an offence will have been committed under The Conservation (Natural Habitats, & etc.) Regulations 1994 (as amended). Disturbance to a known Otter shelter is extremely unlikely as toolbox talks will focus on protection of known shelters, and the ECoW will monitor these areas. However, this procedure has been included for comprehensiveness.

3.2.6.2 Procedures B, C and D describe the procedure in the event of the discovery of the following three types of evidence, formerly unknown on site: a suspected Otter shelter (B), a non-breeding shelter (C) and a breeding shelter (D)


#### A) Procedure in the event of disturbance to a known Otter shelter

3.2.6.3 Any accidental damage or disturbance to a known holt will be reported to the ECoW and work will be stopped immediately. In some circumstances, particularly where high disturbance activities are taking place (blasting, piling) or where the shelter is suspected or known to support breeding Otter, the buffer zone may required to be larger, based on the judgement of the ECoW or an Otter consultant.

3.2.6.4 The ECoW will investigate the nature of the damage or disturbance and report immediately to Viking Energy Partnership.


3.2.6.5 Viking Energy Partnership in consultation with the ECoW will inform SNH of the incident and the actions taken and proposed subsequent actions, as soon as practicable after the incident. Work in the vicinity of the shelter will not commence until SNH advice has been complied with and any necessary licences have been obtained or amended.

3.2.6.6 The ECoW will be responsible for ensuring that any injured Otters are handed over to the proper authorities for care.

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**B) Procedure in the event of discovering a suspected and formerly unknown Otter shelter**

- 3.2.6.7 All construction activity within 200m of the suspected shelter will stop immediately and no personnel will approach the area of the suspected shelter. The ECoW will be informed immediately of the location.
- 3.2.6.8 The ECoW will inform site foreman/manager of the situation in the first instance.
- 3.2.6.9 The ECoW will attend to the location as a matter of urgency to ensure that activity has stopped in the area and no personnel are within 200m of the suspected site, and then investigate any damage to the structure and the location and behaviour of any animals still in the vicinity.
- 3.2.6.10 If at this point the ECoW is able to confirm whether the suspected shelter is that of an Otter he/she will follow Procedure C for a non-breeding shelter or Procedure D for a breeding shelter. If the shelter is still not confirmed as being that of an Otter, the ECoW will proceed to the next step of this procedure and construction will be delayed until the status of the shelter has been confirmed.
- 3.2.6.11 The ECoW will monitor any potential shelter site daily as necessary to confirm its status (and if a breeding female is present the number and approximate age of young). If it is confirmed that the shelter is not that of an Otter, then works may continue.
- 3.2.6.12 The ECoW will check suspected couch sites (above ground shelters, normally in a nest of rushes or grass) for any signs of occupancy. This will require a Licence to Disturb the species issued by the Scottish Government, although it is highly likely that no Otter will be present at that time as a result of disturbance. If it is confirmed that the shelter is that of non-breeding Otter, Procedure C will be adopted and for that of a breeding Otter, Procedure D.
- 3.2.6.13 The ECoW will authorise continued works in the area of the couch once it is confirmed that no Otter is present.

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### C) Procedure in the event of discovering a non-breeding shelter


- 3.2.6.14 All construction works will cease immediately and a buffer zone of a minimum of 50m from the shelter will be erected using appropriate, temporary fencing with notices indicating an ecological buffer zone. No personnel will enter the buffer zone except when accompanied by the ECoW. In some circumstances, particularly where high disturbance activities are taking place (e.g. blasting or piling) the buffer zone may need to be larger, based on the judgement of the ECoW.
- 3.2.6.15 The ECoW will inform Viking Energy Partnership of the status of the shelter.
- 3.2.6.16 The ECoW will consult SNH and the Scottish Government if a licence or amendments to an existing licence will be required and will seek an approval of proposed suitable actions and mitigation proposals. These will only be pursued where there are no alternative solutions:
- 3.2.6.17 If the shelter can be avoided, the buffer zone will remain in place until construction is finished.
- 3.2.6.18 Procedure B will have already confirmed whether the shelter supports breeding or non-breeding Otter.
- 3.2.6.19 If work is required within the buffer zone but will not directly impact the shelter, the shelter will be temporarily excluded or other appropriate mitigation/supervision will be put in place.
- 3.2.6.20 If work will directly impact the shelter, the shelter will be excluded and destroyed under license, but only if there are no alternative solutions and after full consultation with SNH and the Scottish Government.
- 3.2.6.21 Viking Energy Partnership in consultation with the ECoW, will apply for any relevant licence or licence amendments which may be required before work can proceed.
- 3.2.6.22 In the event that temporary exclusion is required, the following procedure will be followed:
- The ECoW will apply suitable one-way gates on the shelter entrances and monitor these until it is certain that no animal is within the shelter;
  - The ECoW will monitor all activities within the exclusion zone until completion;
  - Upon completion of work activities the shelter will be re-opened for use by Otters;
  - The exclusion zone will remain in place until completion of works within the general area.
- 3.2.6.23 In the event of destruction of a shelter, the following procedures will be followed and may need to be implemented by an Otter specialist:
- The Otter specialist will select a suitable site near to the natural shelter site but no less than 50m from the construction zone, and will construct an artificial shelter and a buffer zone of 50m around the new shelter. The artificial shelter will be left in place for as long as possible before exclusion of the natural shelter begins;
  - At an appropriate time, the ECoW will apply suitable one-way gates on the holt entrances and monitor these until it is certain that no animal is within the holt;
  - The ECoW will supervise the destruction of the shelter. Destruction will take place with extreme care to ensure that any animal that may have remained within the shelter is not injured. Although it is rare, animals can be extremely gate shy, and if water is available

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below ground they can survive for a considerable period, past the point where all indications from monitoring suggest that the shelter is empty.

- Destruction will be by hand tools if possible;
- Upon completion of shelter destruction, the ECoW will advise Viking Energy Partnership, SNH and the Scottish Government that destruction is complete, and authorise construction within the area:
- The buffer zone will remain in place around the artificial shelter until site completion;
- The ECoW will monitor the artificial shelter on a monthly basis for signs of use.


3.2.6.24 All of the above exclusion activities may be carried out by another Otter specialist in addition to the ECoW in the case that specialist knowledge or licensing is required. All exclusion activities described in paragraphs 3.2.6.22 and 3.2.6.23 can only be legally undertaken under the terms of an appropriate licence from the Scottish Government.

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#### **D) Procedure in the Event of Discovering a Breeding Shelter**

- 3.2.6.25 All construction works will stop immediately a buffer zone of at least 200m will be erected, consisting of appropriate fencing with notices indicating an ecological buffer zone. In some circumstances, particularly where high disturbance activities are taking place (blasting, piling) the buffer zone may require to be larger, based on the judgement of the ECoW.
- 3.2.6.26 No personnel will enter the buffer zone except when accompanied by the ECoW.
- 3.2.6.27 The ECoW will inform Viking Energy Partnership of the status of the shelter.
- 3.2.6.28 Relevant licences or licence amendments will be sought from the Scottish Government by Viking Energy Partnership in consultation with ECoW.
- 3.2.6.29 The shelter site will be avoided until young are mobile. The ECoW will determine when this occurs. No work will take place within the buffer zone while the female is present with young.
- 3.2.6.30 If disturbance to the shelter is unavoidable and there are no alternative solutions, SNH and the Scottish Government will be consulted and advice sought on appropriate actions and mitigation measures. Actions to deal with the holt will reflect the mitigation measures described in paragraphs 3.2.6.22 and 3.2.6.23 of Procedure C.
- 3.2.6.31 While the female is present, the ECoW will select a suitable site near to the natural shelter site but no less than 200m from the construction zone, and will construct an artificial shelter and a buffer zone of 200m. The shelter will be left in place for as long as possible before exclusion of the natural shelter begins. This will only be done after full consultation with SNH and the Scottish Government.
- 3.2.6.32 When the ECoW determines that young are mobile an exclusion can take place. Viking Energy Partnership in conjunction with the ECoW will obtain the necessary licence and destruction of the shelter would be carried out as described at paragraph 3.2.6.23 of Procedure C.
- 3.2.6.33 All of the above exclusion activities may be carried out by another Otter specialist in addition to the ECoW in the case that specialist assistance is required. All exclusion activities described can only be legally undertaken under the terms of an appropriate licence from the Scottish Government.




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### 3.2.7 Licensing

- 3.2.7.1 No known Otter shelters will be directly affected by construction activities and therefore no application has been made for a Licence to Disturb Otters as per SNH's recommendation.
- 3.2.7.2 The pre-construction Otter survey might reveal an Otter shelter within 100 metres of future works. If this occurs, no works will take place until a Licence to Disturb Otters has been obtained from the Scottish Government under the Conservation (Natural Habitats &c) Amendment (Scotland) regulations 2004.
- 3.2.7.3 In addition, there is potential for indirect effects on the species across the site as a result of disturbance due to construction light, noise and vibration, disrupted movement corridors and pollution. If ECoW checks during the construction phase show that Otter distribution is changing, with new shelters occurring within 100 metres of future works, no works will take place in the vicinity of the new shelter until a Licence to Disturb Otters has been obtained from the Scottish Government under the Conservation (Natural Habitats &c) Amendment (Scotland) regulations 2004.

### 3.2.8 Compliance with best practice and legislation

- 3.2.8.1 The above components of the Otter Protection Plan have been produced after following advice on mitigation and legislation in the following document: SNH: Otters and Development - [www.snh.org.uk/publication/on-line/wildlife/otters/mitigation.asp](http://www.snh.org.uk/publication/on-line/wildlife/otters/mitigation.asp)

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### 3.3 Bird Protection Plan

#### 3.3.1 Summary of the Wildlife & Countryside Act 1981

3.3.1.1 The Wildlife and Countryside Act 1981 is the primary legislation which protects animals, plants, and certain habitats in the UK. The legal protection afforded to wild birds in Scotland, England and Wales in Part 1 of the Act is summarised below. For detailed information, it is advisable to consult the Act itself, which is available from HMSO. Note that following devolution there are some significant differences in the law between the constituent countries of the UK.

##### 3.3.1.2 Definition of a wild bird

3.3.1.3 Under the Wildlife and Countryside Act, a wild bird is defined as any bird of a species that is resident in or is a visitor to the European Territory of any member state in a wild state. Game birds however are not included in this definition (except for limited parts of the Act). They are covered by the Game Acts, which fully protect them during the close season.

##### 3.3.1.4 Basic protection

3.3.1.5 All birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions (see below), to:


- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built;
- intentionally take or destroy the egg of any wild bird;
- have in one's possession or control any wild bird, dead or alive, or any part of a wild bird, which has been taken in contravention of the Act or the Protection of Birds Act 1954;
- have in one's possession or control any egg or part of an egg which has been taken in contravention of the Act or the Protection of Birds Act 1954;
- use traps or similar items to kill, injure or take wild birds;
- have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered, and in most cases ringed, in accordance with the Secretary of State's regulations; and
- intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

##### 3.3.1.6 Penalties

3.3.1.7 The maximum penalty that can be imposed for an offence under the Wildlife and Countryside Act - in respect of a single bird, nest or egg - is a fine of up to £5,000, and/or six months' imprisonment.


#### 3.3.2 General

3.3.2.1 The bird protection measures contained herein will be agreed with Scottish Natural Heritage prior to commencement of works.

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- 3.3.2.2 All bird species (apart from a few “pest” species) are protected by law, under the Wildlife and Countryside Act 1981 (Appendix 1), so that it is an offence to kill them or damage their nests and eggs. Species listed in Schedule 1 of the Act are specially protected, so that is an offence merely to disturb them while nesting. Other specially protected species are listed on Annex 1 of the EU Birds Directive, which also prohibits willful disturbance at the nest. However, if disturbance to the nest of any other bird species without special protection were sufficient to prevent parent birds from incubating their eggs or feeding their nestlings, so that the brood died, this could be regarded as an offence under the 1981 Act. The aim of these guidelines is to avoid this situation.
- 3.3.2.3 A General Licence will be required to deal with ‘Pest’ species and consultation with SNH is recommended. Strict terms and conditions may apply. The licence also details which species are considered to be ‘pest’ species.
- 3.3.2.4 The aim of the bird protection scheme will be to prevent disturbance to breeding birds during the construction period, which includes tree felling. Priority will be given to Annex 1 and Schedule 1 birds and other species of conservation concern, although the nests of common widespread species will also be protected. For most bird species (i.e. excluding specially-protected Annex 1/Schedule 1 species) the principal approach will be deterrence of settlement close to construction sites, so that birds are encouraged to nest away from areas where they would be disturbed. In addition, however, explicit guidance on the actions to be taken if a nest should be found close to a construction site will be issued to all personnel.
- 3.3.2.5 Site inductions and toolbox talks will highlight working procedures near bird nesting areas as well as all other ecologically based site procedures and requirements. The guidance issued to all personnel on site will include information on:
- i) the law regarding wild birds
  - ii) bird species likely to be encountered
  - iii) bird behaviour that may indicate the presence of a nest
  - iv) procedure to follow if a nest or suspected nest site is discovered\*
  - v) marking protocol for nest sites
  - vi) any other aspects of general good practice

\*This will include the immediate cessation of all construction activity and withdrawal of personnel from areas within 50m of the nest (up to 750m for some Schedule 1/Annex 1 species). This exclusion zone will remain in place until the Ecological Clerk of Works has assessed the situation and, in consultation with the Ornithological Consultant, and SNH if necessary, decided on appropriate protection measures to be put in place (see deterrence/mitigation below).

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- 3.3.2.6 Breeding birds of conservation concern will be protected by appropriate mitigation measures, which could include restriction of construction activity to times when the birds were unlikely to be present; screening of construction activity by green netting; or if necessary, the delay of construction at a particular site until it is confirmed by the Ecological Clerk of Works, in consultation with the Ornithological Consultant, that the young have fledged and left the area or that the breeding attempt has failed.
- 3.3.2.7 Proposed mitigation measures will be discussed with SNH, the Ornithological Consultant and the appropriate representatives of the construction company, and will be initiated immediately birds of conservation concern are detected attempting to settle to breed near construction sites. As with the deterrence measures, the site will then be monitored daily, to ensure that the mitigation has been effective. Specific measures for golden plover and merlin are given below.
- 3.3.2.8 The protection of common, widespread species will concentrate on the prevention of disturbance to their nests. Consultation with SNH and RSPB at other wind farm sites suggested that deterrence was an acceptable means to avoid disturbance to nesting, provided that it was carried out very early in the breeding cycle, before nests were established and provided that the birds were merely moved the minimum distance away from the potential source of disturbance and not displaced entirely from the site. It was suggested that in the event that deterrence was not feasible or was unsuccessful, mitigation measures would be implemented. This method has also now been approved by SNH for the Griffin wind farm site.

### 3.3.3 Deterrence methods

- 3.3.3.1 Where deterrence is considered to be a viable option at a particular construction site, measures will be put in place as required, to deter target species from settling so close to the site that they would be disturbed by activities there (generally, within 300m). The most cost-effective technique to move birds further away from sites would be the installation of iridescent reflective tapes, a method which has been applied successfully elsewhere. Tape will be stretched between posts, across the area of the relevant construction site. This area will then be monitored daily, to ensure that deterrence has been effective. If birds continue to visit the exclusion zone, additional tape or more conspicuous items such as revolving reflective discs will be installed.
- 3.3.3.2 If deterrence is not considered to be a viable option, for example due to strong winds regularly destroying tape, mitigation as outlined below will be implemented.

### 3.3.4 Nest protection procedures

- 3.3.4.1 Breeding bird surveys will be carried out in advance of all construction activities. Time scales between surveys and works will depend upon initial results and work progress but will generally range between daily and weekly. Nesting evidence will include the following:
- territory singing / flight display,
  - alarm calling,

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- birds seen carrying food and/or nesting materials,
- calling young,
- birds seen carrying faecal sacs or egg shells,
- visual checks for nest


3.3.4.2 Following pre-works surveys, any nests found will be assessed on a species specific level to determine the most appropriate action to be taken regarding protection zone distances and timescales. As a minimum, protection measures will include:

- A buffer zone around nest sites being demarcated with marker canes and bunting tape. The tape will not be placed in a manner as to cause disturbance in itself.
- Buffer zones will allow for safe areas for fledglings until they are fully mobile.
- Works within the buffer zone will be resumed only after consultation with the ECoW and/or SNH.
- Working procedures in the immediate area outside the buffer zone may entail contractors remaining in their vehicles within a specified distance as agreed with the ECoW.
- If an active nest is suspected by machine operators / site staff, work should cease in the immediate area within 50m of the suspected nest site (up to 750m for some Schedule 1 / Annexe 1 species) and the ECoW contacted immediately for assessment. Works will then proceed only after consultation with the ECoW and/or SNH.

### 3.3.5 Protection measures for golden plover and merlin

3.3.5.1 As these specially-protected species have previously been recorded breeding within or close to the development site, the following guidelines are to be followed to ensure no accidental disturbance to active nest sites. It should be noted that breeding bird surveys will be carried out as a matter of course in relation to all proposed and current works.

- Should a merlin nest be confirmed, an initial buffer zone of at least 500m should be set up between the nest site and works. This may be reduced depending upon topography and nesting stage in conjunction with the behavioural response of the birds. No persons should be permitted within this buffer zone without supervision from the ECoW. It should be noted that the behavioural response of the birds will strongly dictate the effective distance to which works and working methods can proceed.
- If nesting activity is suspected by machine operators / site staff, work should cease in the immediate area to within 500m and the ECoW contacted immediately for

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assessment. Works will then proceed only after consultation with the ECoW and/or the ornithological consultant and SNH.


### 3.3.6 Bird monitoring

- 3.3.6.1 Bird monitoring protocols and methodologies will be developed and agreed with SNH following wind farm consent.

### 3.3.7 References

Pearce-Higgins, J.W., Stephen, L., Langston, R.H.W., Bainbridge, I.P. and Bullman, R. 2009. The distribution of breeding birds around upland wind farms J. appl. Ecol. 46: 1323 – 1331.

Ruddock, M. and Whitfield, D.P. 2007. A review of disturbance distances in selected bird species. Report by Natural Research (Projects) Ltd, for SNH

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## 4 HABITAT PROTECTION PLAN

### 4.1 Habitat Protection Plans

#### 4.1.1 Two habitat protection plans are proposed:

1. Terrestrial Habitats Protection Plan (section 4.2);
2. Aquatic Habitats Protection Plan (section 4.3).


### 4.2 Terrestrial Habitats Protection Plan

#### 4.2.1 The following important habitats have been identified within the development area:

- Sphagnum blanket bog
- Lochans
- Rivers and streams
- Wet grassland communities

#### 4.2.2 Protection of these habitats (through avoidance and minimisation of damage and loss) is necessary for the following reasons:

- Blanket bog (mire) is the dominant vegetation type over the whole survey area. It occurs on peat over 50cm in depth and usually at least 2m deep. The vegetation is characterised by a range of species. 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 and the component communities are Priority habitats on the Scottish Biodiversity List. Some of the Sphagnum rich vegetation communities found on peat within the Viking study area fall within these definitions, but many areas are severely degraded and do not qualify as 'active blanket bog' under standard definitions.
- All of the above habitats are located on peat soils which are a vital store of organic carbon. Deep peat stores carbon accumulated following plant photosynthesis over thousands of years. Organic soils in Scotland were estimated in 2007 to hold 2735 Mt C, 1778 Mt C in deep peat (dominated by blanket bog) and 957 Mt C in shallower organo-mineral soils which include wet heath conditions. Exposure of peat leads to drying and ultimately to oxidation of the peat as carbon dioxide and water, increasing carbon emissions to the atmosphere. Damage to peatlands can also lead to release of dissolved organic carbon in drainage waters, as well as erosion as particulate organic carbon. Both of these sources can then lead to emission of carbon dioxide to atmosphere at a later stage within ecosystems downstream of the original carbon store. The Viking development is being undertaken to reduce UK fossil fuel emissions, particularly carbon dioxide. It would be counterproductive to undertake such development without ensuring that important natural stores of carbon on site are left as intact and little affected as possible.


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- The above habitats and soils are fragile and easily damaged. All site working practices need to consider their possible effects on these habitats and soils and mitigate significant negative effects as far as is reasonably possible.
- The surface waters represent a habitat set which provides the refuges and resting areas for Otter, birds and fish population.

4.2.3 The following protection measures are proposed under the Terrestrial Habitats Protection Plan:

- Inclusion of habitat sensitivity material in site induction procedures and the procedures to be implemented to minimise impacts outside the development footprint.
- Micrositing of development infrastructure to reduce the volume of excavated peat, to be done by the ECoW in consultation with the Geotechnical Clerk of Works and Archaeological Clerk of Works, as necessary;
- Making best use of excavated live turf and deeper peat as part of reinstatement procedures (see TS7 Site Excavated Materials and Reinstatement Plan);
- ECoW authorisation of work off hard ground using low ground pressure machines, to minimise damage to e.g. blanket bog (see TS7 Site Excavated Materials and Reinstatement Plan);
- Ongoing ECoW comparison of pre-construction and post-construction checks of development ground to ensure that the areas of habitat loss and damage are as expected;
- Strict ECoW control of discharges of water on to blanket bog surfaces. Blanket bog habitat gains most of its nutrition from rainfall and it is adapted to low nutrient inputs via rain and snow. Discharge of silty water could partly bury vegetation and greatly increase nutrients, creating negative effects on blanket bog. Discharge on to other habitats, as a mitigation measure for pollution prevention and drainage management, will be preferred (see TS2 Pollution Prevention Plan and TS4 Drainage Management Plan);
- ECoW control over the use of a 50 metre unmarked buffer around watercourses with detailed consideration of mitigation measures for all site working practices to minimise effects on habitats within that buffer zone.



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### 4.3 Aquatic Habitats Protection Plan

#### 4.3.1 Aims

4.3.1.1 There are two aims to this protection plan:

- Maintenance of a high water quality to support aquatic habitats possibly used by Otter populations during and after windfarm construction;
- Maintenance of a high water quality sufficient to support existing aquatic life and aquatic ecosystems.

#### 4.3.2 The importance of maintained high water quality

4.3.2.1 These two aims of this plan are complementary and the required water quality needs to be considered in the context of ecological receptors.

4.3.2.2 During the preparation of environmental statements, consultees (Shetland Anglers Association, SAA) identified several lochs in the proposed development site that are regularly fished, of which some are owned and some are leased by SAA. In addition, a number of burns are used by SAA members. Several important trout and sea trout spawning burns are located in the area. Atlantic salmon was recorded in two watercourses (although these may be associated with fish farms).

4.3.2.3 The most sensitive ecological receptors in likely affected watercourses are spawning grounds for Salmon and Sea/Brown Trout (salmonids). These are termed redds and are local areas of gravel used for salmonid egg laying in early winter. If silt is deposited over the gravels, oxygen diffusion to eggs is reduced or eliminated and developing eggs die. Silt-laden runoff during construction could therefore have negative effects on recruitment into local salmonid populations.


4.3.2.4 Increased acidity can also kill salmonid eggs but is unlikely to occur as an effect of windfarm construction. Instead, it can arise in winter after a period of atmospheric acid deposition upon snow lying for a considerable time, with the increased acidity of stream waters occurring during snow melt. These events are generally rare in Scotland but need to be considered as part of monitoring during construction.

4.3.2.5 Water quality protection measures, including mitigation for silt-laden waters, are included in TS2 Pollution Prevention Plan, TS4 Drainage Management Plan, TS5 Watercourse Crossing Plan and TS7 Excavated Materials and Reinstatement Plan, TS9 Environmental Incident and Emergency Response Plan.

4.3.2.6 Water quality monitoring is proposed, to be undertaken by an independent consultant. The ECoW will be responsible for reporting the results of independent monitoring during the construction period. Further details are provided within TS6, Water Quality Monitoring Plan.

4.3.3 The Aquatic Habitats Protection Plan is divided into four sections, covering both pro-active and reactive measures as follows:

- General protection measures;
- Design of safe watercourse crossings;

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- Personnel induction; and
- Pre-construction checks and monitoring.

#### 4.3.4 General Protection Measures:


- The TS2 Pollution Prevention Plan, TS4 Drainage Management Plan, TS5 Watercourse Monitoring Plan and Excavated Materials and Reinstatement Plan, TS9 Environmental Incident and Emergency Response Plan will together prevent contamination of watercourses and will protect Otter, other species, aquatic habitats and habitats close to watercourses. There will be daily visual inspections of watercourses for pollution, and independent monitoring of water quality at agreed locations (TS6 Water Quality Monitoring Plan) when operations are carried out within an area;
- A minimum 10m buffer (and probably up to 50m) will be maintained between working areas, machinery and watercourses in all areas except at watercourse crossing points;
- Pollution prevention measures will be installed and maintained as appropriate, including silt interception traps, settling lagoons or mobile silt-trapping units (such as Siltbusters or equivalent device), as well as installation of splash boards at watercourse crossing points to prevent contamination from track run-off;
- Chemicals, oils and hazardous materials will be stored securely away from the watercourses;
- Spillage contingency kits will be provided in all site vehicles and there will be daily checks for oil and fuel leaks.
- Felling and construction personnel shall be provided with an emergency telephone number for the ECoW.

#### 4.3.5 Design of Watercourse Crossings

- 4.3.5.1 All watercourse crossings will be designed to cope with extreme rainfall events. This will minimise the risk of bank erosion and flooding, with possible consequent loss of habitat.
- 4.3.5.2 Any drainage diversion required in forming a watercourse crossing will be purely temporary and will last only a few hours. Such diversions will only affect minor tributaries and will not occur on the main watercourses.
- 4.3.5.3 Watercourse crossings using culverts will sever aquatic habitats. This effect will be minimised by ensuring that culvert floor levels are below the watercourse floor, with mineral material inserted to create a mineral floor.

#### 4.3.6 Personnel Induction

- 4.3.6.1 All relevant site personnel will be given an induction by the Ecological Clerk of Works (ECoW). The induction will be in a format of a toolbox talk with the aim of:
- Making personnel aware of legal obligations placed on them in relation to the Controlled Activities Regulations 2005, together with protected species using watercourses (e.g. Otter) and the responsibilities of personnel for ensuring they do not breach that legislation;

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- Discussing the quality of pre-construction aquatic habitats within the site and downstream, together with its importance for fishing;
- Making personnel aware of the requirement for pre-construction checks by the ECoW at proposed new and upgraded watercourse crossings;
- Outline the key mitigation methods in place for maintaining the water quality of aquatic habitats.
- Ensuring that personnel are aware of the emergency response procedures to be followed in the event of a pollution incident.

#### **4.3.7 Pre-Construction Survey, Checks, Monitoring and Incidents**

- 4.3.7.1 Qualitative and semi-quantitative inspections of aquatic habitats will be included as part of pre-construction surveys. These will include hydrochemical as well as ecological (benthic diatoms invertebrate and fish population surveys) baseline surveys. The scope of such surveys will be agreed within the detailed Water Quality Monitoring Plan (refer to TS6) prior to commencement of construction. A photographic record will also be made of sample locations and locations will be recorded using GPS.
- 4.3.7.2 Quantitative measurements of water quality will be undertaken at a series of fixed locations pre-, during and post-construction as described in TS6 Water Environment Monitoring Plan.
- 4.3.7.3 The ECoW will carry out further checks of aquatic habitats at the baseline sample locations at set intervals during the construction period, or following the triggering of an incident response. Each set of checks will use the same sampling methods, supplemented by visual and olfactory sampling for oil and fuel traces after construction begins.
- 4.3.7.4 Results from regular specified physical sampling will be used to assess any evidence of siltation, bank erosion and flooding. Additional sampling locations will be added at proposed water crossing locations, before and after construction, to assess the effects of construction on aquatic conditions.
- 4.3.7.5 Results from sampling after a pollution incident response will be used to seek and stop the cause of the incident. Further sampling will be undertaken after implementing pollution control measures to be sure that measures have been effective.
- 4.3.7.6 The ECoW will be responsible for maintaining a mapped record of checked areas and the results of all sampling. Results will be included in ECoW reports covering water quality.