

Chapter 9: Ecology

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9 Ecology

9.1 Executive Summary

- 9.1.1 This Chapter presents the findings of an Ecological Impact Assessment for the Proposed Development. All relevant aspects of ecology (see Chapter 8 for ornithology) are reviewed and re-assessed, the potential impacts of the Proposed Development on the Sandwater Loch Site of Special Scientific Interest (SSSI) (see Figure 9.1) and on otter are focused on. This Chapter should be read in conjunction with Chapter 9: Ecology, of the 2016 Environmental Statement (ES), which is included as Appendix 9.1 to this Chapter.
- 9.1.2 The ecology surveys undertaken for the withdrawn 2016 ES are still applicable and relevant to the Proposed Development. The application boundary remains largely the same, and therefore the previous study areas are sufficient to assess the Proposed Development. The one exception to this is for otter, where a new survey was completed in January 2019 and the assessment reflects this.
- 9.1.3 The assessment process for ecology, including the Sandwater SSSI follows the standard assessment method. It is based on the current and previous CIEEM guidelines (CIEEM, 2018). As with all environmental assessment, there is an element of professional judgement used.
- 9.1.4 Potential effects on the Sandwater SSSI, otter and other important ecological features can arise from both construction and operation of the Proposed Development. The potential for cumulative effects on otter is addressed within the assessment.
- 9.1.5 The evaluation of effects, prior to consideration of mitigation/safeguarding, finds that the Sandwater SSSI, otter (both in relation to the Proposed Development and cumulatively) and M17 blanket bog could have Moderate and significant effects under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
- 9.1.6 Previous proposed mitigation measures are thoroughly reviewed and updated. Compensation is included for the loss of a small area of blanket bog habitat. The design of the new bridge across the Burn of Pettawater allows for the continued passage of otter both upstream and downstream on the watercourse.
- 9.1.7 Provided that all the mitigation and compensation detailed in the chapter is implemented then there are not likely to be any significant effects on ecology for the Proposed Development. The residual effects of the Proposed Development on all important ecological features will not be significant under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Sandwater SSSI, otter and all other important ecological features are assessed as having a maximum significance of effect of Minor Adverse.
- 9.1.8 In addition to the impact assessment, Sandwater SSSI and otter present in the area are fully recognised as being sensitive in relation to the Proposed Development. The full implementation of all the mitigation measures detailed in this chapter will help to ensure that all construction and operational risks to them are fully recognised and minimised.

9.2 Introduction

- 9.2.1 This Chapter presents the findings of an Ecological Impact Assessment (EclA) for the Proposed Development. While all relevant aspects of ecology (see Chapter 8 for ornithology) are reviewed and re-assessed, the potential impacts of the Proposed Development on the Sandwater Loch Site of Special Scientific Interest (SSSI) and on otter are focused on.
- 9.2.2 This Chapter should be read in conjunction with Chapter 9: Ecology, of the 2016 Environmental Statement (ES), which is included as Appendix 9.1 to this Chapter. A thorough review of the previous Chapter 9 has been completed.
- 9.2.3 The assessment has been undertaken by Dr Andy Mackenzie, a partner in Mackenzie Bradshaw Environmental Consultants (MBEC). Andy is a very experienced applied ecologist having completed numerous impact assessments and practically implemented mitigation for a wide range of species and habitats. He has been working on wind farm construction sites in Scotland, as a lead Ecological and Environmental Clerk of Works (ECoW) for the last few years and therefore understands the practicalities of construction, as well as ecological surveying and assessment. Andy is a Chartered Ecologist and holds/has held a variety of protected species licenses in Scotland. Andy has been put forward by VEWf to undertake the lead ECoW role for the construction of Viking Wind Farm (and all associated infrastructure) and he has been accepted for this role by Shetland Islands Council.

9.3 Scope and Consultation

Previous Assessment Findings

- 9.3.1 Sandwater Loch SSSI was assessed under the 2016 ES. Given the buffer of the existing B9075 and the limited number of watercourses passing from the construction area to the SSSI, it was noted that the likelihood of pollutants entering the Sandwater Loch was low. Furthermore, given the volume of the body of water it would be unlikely that the quantity of pollutants, if they did enter the waterbody, would be sufficient to have a detrimental effect either to the pH (and therefore the mesotrophic status of the loch), or the flora associated with the transitional fen habitats. With the adoption of mitigation, including best practice measures to ensure that water quality is maintained, and pollution and sedimentation risk is controlled, it was considered in the 2016 ES that there would be no significant effects on the nationally important Sandwater SSSI during both construction and operation of the road.
- 9.3.2 Habitats and groundwater dependent terrestrial ecosystems (GWDTEs) were assessed in the 2016 ES. It was predicted that habitat loss would be Minor with the exception of a small permanent loss of blanket bog habitat; however, assuming mitigation is fully implemented, effects would not be significant. Similarly, in relation to GWDTE's, the 2016 ES found that the loss would be limited to two small areas of mire habitat; all other habitats recorded were up slope and so groundwater would be unlikely to be affected. However, the two areas of mire were found unlikely to be reliant on groundwater influences, as the species present were judged to be present due to the collection of surface water run-off from surrounding mire habitats. No significant effects were predicted to GWDTE habitat.

9.3.3 For otter the 2016 ES concluded that as long as new bridges were appropriately designed to minimise disruption to otter movements, new structures would be unlikely to result in significant effects with the adoption of appropriate mitigation measures. No significant effects during operation were predicted.

9.3.4 Finally, the 2016 ES found that as habitat loss would be localised and of small scale on the stream banks, and pollution events would be short in duration, this would be unlikely to affect the overall characteristics of watercourses, fish and freshwater invertebrate populations. No significant construction or operational effects were predicted.

Screening

9.3.5 The B9075 Sandwater Road Realignment, Screening Opinion Request (VEWF, 2018) noted that the realigned section of road for the Proposed Development is still to the north of the existing B9075 road. Therefore it was anticipated that similar residual effects (i.e. not significant) on the Sandwater Loch SSSI and on habitats and species would be expected, as predicted in the 2016 ES (VEWF, 2016). The text in the Ecology Chapter of the 2016 ES (see Appendix 9.1) went on to say that as long as the proposed mitigation measures were implemented it was considered unlikely that the Proposed Development would lead to any significant effects. It was proposed that the assessment findings and mitigation measures from the 2016 ES were reviewed and updated in light of any changes associated with the Proposed Development. Mitigation measures and commitments would also be included in a new schedule of mitigation measures (VEWF, 2018).

9.3.6 The Screening Opinion from Shetland Islands Council (SIC, 2018) makes it clear that “The excavation and engineering operations associated with the proposal have potential to impact on Sandwater SSSI”. Therefore, SIC required an Environmental Impact Assessment to be completed in relation to the Sandwater SSSI. This is fully addressed in this Chapter.

Pre-Application Briefing Note

9.3.7 Following issue of the Screening Opinion, a Pre-Application Briefing Note was prepared by VEWF and issued to SIC, SNH and SEPA. This Briefing Note is included in Appendix 6.1 of this EIA Report. The briefing note outlined the proposed scope of the EIA Report for the Proposed Development. In relation to ecology, the briefing note confirmed:

“The EIA Report will include an assessment on the potential effects of the Proposed Development on Sandwater Loch SSSI. The assessment will utilise existing survey data collected for the 2016 ES. No further survey effort is proposed.

No further assessment on habitats, protected species, fish or macroinvertebrates is proposed as it is anticipated that with the implementation of appropriate mitigation measures, residual effects would not be significant. Mitigation measures would include best practice design at all important watercourse crossings to allow easy and safe passage of otters and fish and to ensure access is not restricted. In addition, marked exclusion zones at all ‘at-risk’ watercourses and water bodies would be applied to minimise any disturbance to protected species. Where this is not possible (such as crossing points), access to watercourses would be kept to a minimum.

Mitigation measures will be identified and included in a new schedule of mitigation measures, as part of the EIA Report. Detailed mitigation measures would be outlined in a

CEMP (pre-construction version) which would take into account any additional findings from pre-construction surveys and input from an ECoW. A draft CEMP will be included with the EIA Report.”

Response to Pre-Application Briefing Note

- 9.3.8 Consultation with SIC, SNH and SEPA confirmed that, for the majority of subject areas, the scope of works proposed in the Pre-Application Briefing Note was considered appropriate. In relation to ecology, SEPA requested that more information be included on Ground Water Dependent Terrestrial Ecosystems (GWDTE) including a comparison with the effects of 2016 Application.

Scope

- 9.3.9 In line with the Screening Opinion and Pre-Application Briefing Note, the scope of the EclA set out in this Chapter is focussed on the potential effects of the Proposed Development on the Sandwater Loch SSSI (see Figure 9.1). In addition, this Chapter also provides a review of the assessment findings and mitigation measures from the ecology chapter contained within the 2016 ES (see Appendix 9.1) updating where required to reflect the Proposed Development. An assessment for otter (Eurasian otter, *Lutra Lutra*) is also provided, based on a new survey completed in 2019.

Use of Existing Survey Data

- 9.3.10 The ecology surveys undertaken for the 2016 ES are still applicable and relevant to the Proposed Development, given that the application boundary remains largely the same, and therefore the previous study areas are sufficient to assess the Proposed Development. The one exception to this is for otter, where a new survey was completed in January 2019 and the EclA correspondingly updated to reflect this. It was determined by MBEC and VEWf that a new otter survey of the area should be undertaken due to the previous survey being over 3 years old, the European Protected Species status of otter and the generally high density of otter in Shetland. It was thought possible that otter presence and use of the area could have significantly changed since 2015.
- 9.3.11 Summaries of the previous surveys, the findings and their implications in relation to the previous road alignment are all detailed in Appendix 9.1. The ecology survey information presented in the 2016 ES and the features/species considered further or scoped-out, is not only based on those surveys but has been continued and refined from the previous surveying and ecological information presented in the Environmental Statement for the Viking Wind Farm (Viking Energy Partnership (VEP), 2009).
- 9.3.12 While the Proposed Development route has locally changed in alignment, the past surveying results are still applicable (these are compared in more detail in the review which follows). The previous Figure 9.1 (see Appendix 9.2) indicates the survey areas previously used. Given the limited movement of the road alignment north for the Proposed Development (see Figure 3.1) the previous survey areas are still applicable.

Field Survey

- 9.3.13 Building on the previous survey data, an updated otter survey was undertaken on the 15th and 16th January 2019 by the author. Key results and implications from this survey are all

reported in this chapter, in relation to the Proposed Development. Otters are a European Protected Species and known to be occasionally persecuted in Scotland. Because of the possibility of survey information being used for illegal means, it is usual practice not to report survey details and locations. Therefore, the detailed otter survey report is provided as a Confidential Annex to the main EIA Report and will only be made available to Shetland Islands Council (SIC) and Scottish Natural Heritage (SNH).

- 9.3.14 The Sandwater SSSI shoreline was walked by the author on the 15th of January 2019 and this combined looking for otter evidence over a wider area and looking at elements of the SSSI designation. A walkover survey of the Proposed Development, as well as the existing B9075 road, was undertaken by the author on the 17th January 2019.

9.4 Methodology

Otter Survey

- 9.4.1 The new otter survey (Eurasian otter, *Lutra Lutra*) was designed to cover, as a minimum, all of the potentially suitable otter habitat within 200m of any of the construction work/disturbance associated with the B9075 road realignment and upgrade. 200m is the distance within which SNH have deemed disturbance is likely to otters using a breeding holt (SNH, 2019a). The potentially suitable habitat present in this area consisted of the Burn of Pettawater, the Sandwater loch northern shore and the Burn of Weisdale, along with all relevant tributaries/drains. In practice, a much larger survey area was walked to try to maximise the level of information gained on otter and their use of the surrounding area.
- 9.4.2 Access permission from landowners was received for all the areas necessary, through VEVF. There was one exception, access permission was refused for one area of farmland which included the Burn of Weisdale downstream of the B9075 road bridge.
- 9.4.3 A desk study was completed which consisted of sourcing all previous otter survey information for the area of interest. Shetland Biological Records Centre were not contacted in relation to the current survey because it was thought unlikely that significant new records would exist since 2015, which would make any material difference to the survey results.
- 9.4.4 Otters are active all year round, and can therefore be surveyed in Scotland at any time of the year. This otter survey followed a similar approach to that described for the 2003-4 national survey of otter distribution in Scotland (Strachan, 2007), with the survey methods used in this survey also being the same as those used by others in 2015, for the previous survey in this location.
- 9.4.5 All sections of watercourses and waterbodies were checked carefully for signs of the presence of otter. Areas that could not be checked are all noted within the survey report. Both banks as well as features such as waterfalls, exposed rocks, gravel bars, beaches and any other debris present in or adjacent to the channels were all checked carefully. In addition, areas of the upper banks/valleys upslope of the watercourses were also searched for any evidence of otter use and any features which could be used as resting sites by otter.
- 9.4.6 Otter field signs used included spraints (faeces), anal gland deposits, feeding remains, holts, couches, slides, prints and tracks. A handheld Global Positioning System (GPS) was

used to record the locations of important features and signs (accuracy indicated as ± 3 m for the whole survey). In practice, the accuracy of GPS recording can be reduced at times due to very thick cloud or steep topography.

- 9.4.7 The otter survey was carried out by a suitably qualified and experienced ecologist. This ecologist (Dr Andy Mackenzie, MBEC Partner) is familiar with all of the relevant field signs and has a very good understanding of the habitat requirements of otters. He has been a practicing professional ecologist for over 28 years and has held various licences from Scottish Natural Heritage for otter survey and safeguarding.

Assessment

- 9.4.8 This section summarises the assessment process for ecology, including the Sandwater SSSI. This EclA follows the standard assessment method and is the same assessment process as the 2016 application followed for ecology and nature conservation assessment. The EclA is based on the current and previous CIEEM guidelines (CIEEM, 2018). As with all environmental assessment, there is an element of professional judgement used.

- 9.4.9 In summary, assessing the significance of effects for ecological and nature conservation assets is a multi-stage process consisting of the following steps:

- Determining the importance of different wildlife and nature conservation assets (or 'important ecological features') based on a systematic review of relevant nature conservation criteria. Importance (conservation value) determines whether wildlife assets are taken forward in the impact assessment process or not;
- Magnitude of impact is next determined on those important wildlife features. This requires a detailed understanding of how each feature will respond to the Proposed Development and is used to define the scale or magnitude of the effect on the receptor. There are many different elements to determining the magnitude of impact including, but not limited to, the duration, the timing, the viability of survival, any likely cumulative impacts;
- Significance of effect is determined by combining conservation value with magnitude of impact which results in a category of Major, Moderate, Minor or Negligible, or a combination of two of these. The significance of effect on a particular feature can be either adverse or beneficial;
- Mitigation measures may be available and applicable, which can be used in the proposed development to reduce the significance of effect on an important ecological feature. Mitigation measures are many and varied but the important thing is that they are either proven or have a high likelihood of success, preferably through prior experience; and
- The residual effect is the final stage once mitigation measures have been taken into consideration with the significance of effect. Mitigation measures would usually be expected to reduce the significance of effect for an adverse impact on an important ecological feature. The residual effects are considered to be significant under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 if they are at Moderate or Major levels for both adverse and beneficial impacts.

9.5 Baseline Conditions

Sandwater SSSI

- 9.5.1 Sandwater SSSI is located immediately south of the existing B9075 at the east end of the Proposed Development (see Figure 9.1). The SSSI is 36.8ha in size (SNH, 2019b). It has been designated since 1972 and is notified as an example of a mesotrophic loch and for its open-water transition fen (extensive beds of common club-rush (*Schoenoplectus lacustris*) (SNH, 2019b).
- 9.5.2 The SSSI supports a diverse plant community of submerged aquatic plants with six species of pondweed (*Potamogeton spp.*), including the nationally scarce slender-leaved pondweed (*Potamogeton filiformis*). It is the largest and best example in Shetland of club-rush swamp. The loch is relatively shallow and although surrounded by dwarf shrub and acid moorland, it is mesotrophic with a pH around neutral (7) because of the strong influence of the underlying geology (a band of crystalline limestone is present). The Sandwater SSSI was assessed by Scottish Natural Heritage (SNH) in 2004 as being in Favourable, maintained condition (SNH, 2019b).
- 9.5.3 The Sandwater SSSI is evaluated as being nationally important for nature conservation due to its notified features and the quality of those features.

Otter

- 9.5.4 Eurasian otter (*Lutra lutra*) has previously been assessed as the only important (from an impact assessment and nature conservation perspective) mammal species present within the Proposed Development area (Appendix 9.1). Otter are a European Protected Species and fully protected in Scotland. A new survey has been completed for otter in January 2019 and this is detailed in an accompanying Confidential Annex. Following this survey, an assessment has been provided for otter in relation to the Proposed Development, utilising both historic and current survey information.
- 9.5.5 There is limited historical data for otter in the area (records from Shetland Biological Records Centre in 2015). One sighting of an otter was recorded from the southern shore of Sandwater, approximately 1km south of the Proposed Development in the year 2000. There is also a record of an otter being seen at the outflow of the Pettawater in 1995, approximately 3.5km to the north of the Proposed Development. There is a record of an otter sighting from the mouth of the Burn of Weisdale, at Weisdale Voe in 1995 and this was approximately 2.5km to the south of the Proposed Development. A dead juvenile otter was found approximately 10m east of the existing Burn of Pettawater Bridge (B9075) in 2012 during a previous otter survey for the wind farm. Although a definitive cause of death was not established via post mortem, it was presumed to be a road traffic mortality (VEWF, 2016).
- 9.5.6 Otter surveys have been completed within the vicinity of the Proposed Development in the recent past. Surveys were completed in 2012 and 2015 for VEWF, both of which concluded that otter were present on both the Burn of Pettawater and the Burn of Weisdale. No active otter holts or sheltering/resting places were found during these surveys, but suitable habitat for these was identified within the survey area.

- 9.5.7 The January 2019 survey for otter is included as a Confidential Annex due to the locational details provided for otter. This otter survey confirmed that otter are currently present and using both the Burn of Pettawater and the Burn of Weisdale. Otter prints, indicative of female otter, were found in both catchments upstream from the existing crossings of the B9075 road. They are likely to be moving up and down these burns fairly regularly from the evidence found. Evidence indicated that otter were crossing the existing road surface at both B9075 bridges i.e. both watercourses. Otter resting sites and potential otter resting sites were found in both valleys/catchments. One potential (unconfirmed at present) non-breeding, single-holed otter holt was within the planning boundary for the Proposed Development. This potential holt is north of the existing road, on the Burn of Weisdale. It was over 30m north of the nearest northern edge of the existing road and this would also be over 30m north of the new road because it is back on the original alignment in this area. This potential holt does requires further consideration in relation to the linked Viking Wind Farm works due to its location, but not the Proposed Development. This is discussed further under the sub-heading of “Cumulative Effects on Otter”.
- 9.5.8 The Sandwater SSSI does not include otter as part of features for its designation, although they are present. There are no designated sites within the wider surrounding area that include otter as either a primary reason for designation or a feature of the designation. The closest sites are Yell Sound Coast Special Area of Conservation (SAC) which is also a SSSI including otter, and Hascosay SAC. The Yell Sound Coast SAC is approximately 15km north of the Proposed Development. Since there is a clear geographical separation between the otters surveyed here and the populations further north on Shetland, there is no requirement for an appropriate assessment of any European site or consideration of any other SSSIs close by.
- 9.5.9 The otters in the area including the Proposed Development are assessed as being of international importance. The otter population in Shetland is one of the densest anywhere in the Eurasian otter’s range. Otters are fully protected and included within Annex 2 of the Habitats Directive.

Review of Other Important Ecological Features

Vegetation and Ground Water Dependent Terrestrial Ecosystems

- 9.5.10 The vegetation surveying undertaken previously (Phase 1 Habitats and National Vegetation Classification) indicated that there were common habitats present, the majority of which were blanket bog related (see Figure 9.2 and Figure 9.3 in Appendix 9.2). Wet and dry dwarf shrub heath, riverine edge habitat, acid grassland, flushes and marsh/marshy grassland were also present. No notable or protected plants species were found during all the previous surveys. Tables 9.6 and 9.7 in the previous ecology chapter indicate the habitat types and amounts present within the overall study area (see Appendix 9.1).
- 9.5.11 Some National Vegetation Classification (NVC) communities present within the study area contain moderate or high potential to be Ground Water Dependent Terrestrial Ecosystems (GWDTes). In other words, these plant communities can be reliant on ground water to some extent. Figure 9.4 in Appendix 9.2 indicates these GWDTes within the study area for the previous application. Table 9.7 in the previous ecology chapter indicates the NVC habitat types that have potential to be GWDTes and the amounts present within the overall study area (see Appendix 9.1). M23 *Juncus effusus* / *acutiflorus* – *Galium palustre* rush pasture and M6 *Carex echinata* – *Sphagnum recurvum* / *auriculatum* mire both have

potential to be Highly groundwater dependent and M15 *Trichophorum cespitosum* – *Erica tetralix* wet heath and U6 *Juncus squarrosus* – *Festuca ovina* grassland have potential to be Moderately groundwater dependent.

Watercourses

- 9.5.12 Freshwater studies undertaken previously (fish and invertebrates) for both the catchments of the Burn of Pettawater and the Burn of Weisdale indicated that salmonids (*Salmo trutta*, *Salmo salar*), eels (*Anguilla anguilla*) and three-spined sticklebacks (*Gasterosteus aculeatus*) are variously present and breeding. The Burn of Weisdale is regarded as being an important sea trout spawning habitat. Invertebrate studies indicated that communities in both burns consisted of common and widespread species which would be expected in upland watercourses. No particularly rare species were found previously (see Appendix 9.1). Both burns have been ranked as Fair to Good under various accepted measures of chemistry and biology (Water Framework Directive). It was clear from the previous surveys that there was no significant organic pollution or significant acidification in either watercourse.

Mammals and Other Animals

- 9.5.13 Otter is dealt with under separate sub-headings in this chapter due to the completion of a new otter survey in 2019. The previous impact assessment for ecology in the 2016 application (see Appendix 9.1), ruled out assessment consideration for any other animals due to their status on the Shetland mainland. Mountain hare (*Lepus timidus*) and rabbit (*Oryctolagus cuniculus*) have been seen by the author within the study area and likely evidence of field mouse (*Apodemus sylvaticus*) was also seen in 2019. Other species including common frog (*Rana temporaria*), stoat (*Mustela ermine*) and polecat-ferret (*Mustela putorius x M. furo*) are all likely to be present within the study area and wider surroundings. No evidence of mink presence (*Neovison vison*) was seen during the 2019 otter survey in potentially suitable habitat for that species. Reptiles are absent from Shetland (Barne *et al.*, 1997) and previous surveys for the Wind Farm (VEP, 2009) determined that freshwater pearl mussel (*Margaritifera margaritifera*) were absent from all surveyed areas, including the surveyed sections of the Burn of Weisdale and the Burn of Pettawater.
- 9.5.14 Having walked over the study area and the surrounding areas, as well as surveying for otter, the previous approach taken is correct i.e. other animal species are ruled out of further consideration in this ecological impact assessment. Indirectly, mitigation measures included for otter and pollution prevention (see Section 9.7 in this Chapter for details) will generally be applicable and of benefit to other species present within the area during construction and operation of the Proposed Development.

9.6 Potential Effects

Sandwater SSSI

- 9.6.1 Potential effects to the SSSI interests from construction and operation of the Proposed Development relate to the following potential impacts: pollution and sediment release; hydrological alteration (increase or decrease in water residence times); and/or water chemistry change. The potential impacts could be over the short-term (construction) or over the longer-term (operation).

Otter

9.6.2 Construction and operation of the Proposed Development has the potential to negatively impact otter directly or indirectly and over the short or longer-term via the following effects:

- physical injury or death of individuals;
- loss of access to areas of territory through habitat severance;
- direct damage or disturbance causing loss of shelters (holts and couches);
- damage to routes used by otters within the Proposed Development site;
- damage to watercourses by runoff, pollution and physical blocking of burns; and
- disturbance caused by noise and lighting from construction and/or the operation of the new road.

Cumulative Effects on Otter

9.6.3 There is potential for cumulative effects in relation to otter. This regards the Proposed Development and the other linked infrastructure required for the wind farm. There is a temporary construction compound and a new access track with a new bridge over the Burn of Weisdale proposed close to the existing Kergord junction on the B9075. This other linked development could affect a potential otter holt identified in the 2019 otter survey for the Proposed Development.

9.6.4 Regarding the potential for any other cumulative effects, the same conclusion has been reached as the 2016 application did i.e. there are no other important ecological features where significant cumulative impacts/effects are predicted or likely for the Proposed Development in combination with the Viking Wind Farm and/or any other planned or consented developments on the Shetland mainland.

Review of Other Important Ecological Features

Vegetation and Ground Water Dependent Terrestrial Ecosystems

9.6.5 The potential effects in relation to habitats are mainly at the construction stage where ground disturbance and vegetation destruction occur. This can lead to total habitat loss or habitat damage. As well as direct loss and damage to habitats, some of which are potentially groundwater dependent, severance of groundwater supply due to construction and formal drainage can also lead to longer-term habitat loss through habitat change. Operational impacts to habitats tend to be related to the road edge areas where e.g. dust and air pollution can have longer-term impacts on vegetation on very busy roads.

Watercourses

9.6.6 The potential impacts listed previously in relation to watercourses were comprehensive and realistic (see Appendix 9.1 for further details). Habitat loss, severance and pollution related construction impacts being the most important for watercourses, fish and invertebrates and operational impacts being at a similar level of risk to those for the existing road.

9.7 Evaluation of Effects

Sandwater SSSI

- 9.7.1 The Proposed Development will all be routed to the north of the existing B9075. There will be no land take or vegetation disturbance (temporary or permanent) within the boundaries of the SSSI and the red-line boundary is all outwith the SSSI boundary. Therefore, there will be no direct loss of habitat associated with the SSSI's designated features or species. The existing B9075 will remain in place and open to public traffic during the new road construction and will create an effective physical barrier between construction works and the SSSI. However, the Burn of Pettawater and a few smaller gully and flush drains from the bog to the north do travel through the existing B9075 and drain into the northern end of the Sandwater, thereby providing a potential pathway and connection to the construction and operational phases of the Proposed Development (see Section 10.7, Chapter 10 Hydrology, Hydrogeology and Geology for further details).
- 9.7.2 Pollution associated with the construction works could include increased silt loading and sedimentation caused by disturbance of peat and mineral materials. Hydrocarbon pollution (e.g. diesel, hydraulic fluids and oils) is possible from machinery working on site and could enter a watercourse if it is not dealt with promptly and removed. It is also possible that other chemical pollution could arise from materials used on site during construction (e.g. liquid concrete entering a watercourse). It is intended that the new section of road will be used by construction traffic prior to it being finalised to the standards expected for public road use. Therefore, there is potential for poor initial drainage design and inadequate mitigation for road surface drainage to lead to increased siltation runoff during this phase. To an extent, there will be a protective buffer effect from the existing B9075 and the drains and watercourses crossing this are limited in number and can be adequately seen, marked and safeguarded during higher risk construction operations and initial construction. Sandwater, although a fairly large body of water, is not a very deep loch so the volume of water in it could be described as medium, rather than large. While all risks of pollution should be avoided/minimised at source within the construction corridor, such a volume of water could also act as significant dilution of any pollutant that were to enter it. To be clear, such an approach is not to be used/relied upon but in an exceptional event it would be effective. The only time when such a temporary situation could arise would relate to a very large natural precipitation event. Such dilution would provide a last line of defence for the SSSI and be sufficient that an adverse effect on either the pH (and therefore the mesotrophic status of the loch), or the flora associated with the transitional fen habitats (at the south end of the loch) would be unlikely.
- 9.7.3 The hydrological regime of Sandwater is also important. At present the north end of the loch, close to the Proposed Development, is a significant source for surface water entry, although there are other small watercourses entering around the loch in multiple locations. While walking round the loch in January 2019 the author witnessed a significant inflow of underground water entering the loch in one location. This was visible on the surface of the loch, at approximately 7m out from the shore, as a constant 'boiling' of the water surface in one fixed location. While the exact importance and proportions of ground water entry to surface water entry are unknown, this observation does confirm that both are present in Sandwater, at least at certain times of year. The inflows of water filling the loch, as well as direct precipitation, are important because they have a direct correlation with the residence time that any single volume of water remains in the loch. This also

determines the chemical characteristics of the loch water. It is likely that groundwater sources would be a higher pH (given the characteristics of the underlying geology) than surface water only feeds, which would tend to be towards the acidic end of the pH scale. The pH of Sandwater is one of the key determining factors in the vegetation that is present and relates directly to the designation of SSSI. In relation to the Proposed Development it is therefore very important that the surface water feeds at the north end of the loch remain unchanged from the current situation. For the Burn of Pettawater no impacts or effects would be predicted because a new bridge will be built spanning the watercourse so no alteration in flow is likely or expected. However, there is the potential for smaller surface drainage from the bog to the north to be altered by formal drainage construction. There is also the potential for increased collection of water and increased direct or indirect discharge into Sandwater due to additional road edge drainage. While it is thought any change in the relative volumes of inflow water to Sandwater would be very small, nevertheless, it is important that this does not occur.

- 9.7.4 There is the potential for operational impacts and effects to be greater in the short-term because both the new road and the existing B9075 would be operational during the construction of the wind farm, with associated construction traffic. Increased operational impacts in the short-term would relate to drainage off the new road prior to it being fully surfaced, and could involve both sediment release and hydrocarbon pollution. In the longer term, sediment and chemical pollution risk is assessed as being comparable to that on the existing B9075 in relation to the SSSI.
- 9.7.5 Accounting for all of the above, the magnitude of any likely effect caused by construction and operation of the Proposed Development would be low. The significance of such an effect, prior to mitigation measures being applied, would be assessed as Moderate, and significant under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

Otter

- 9.7.6 Construction of the Proposed Development will result in a permanent loss of a small area of upper bank (riparian habitat). This would occur due to the construction of a new bridge over the Burn of Pettawater and would be likely to be less than 20m in length for both banks. However, this has the potential to cause habitat severance or more likely, encourage otter to go up and over the new road in this location if the bridge design does not account for otter. Such otter road crossing could result in injury or mortality of otter on the new road.
- 9.7.7 The 2019 survey recorded no evidence of any otter holts or resting places within the red-line boundary of the Proposed Development. There is one active holt (lower Burn of Pettawater) and one potential holt (north of the B9075 bridge over the Burn of Weisdale) close by but accounting for a 30m buffer zone (SNH, 2019a) both are outside of the construction/direct disturbance area for the Proposed Development. Therefore, on current survey evidence there is no likelihood of any resting site being directly disturbed or destroyed by the new road alignment.
- 9.7.8 Any discharges of sediment or reduction in water quality (e.g. a fuel spill) during construction could also indirectly adversely affect otter through damage to fish populations and watercourses overall, and their ability to forage in the area. This is deemed unlikely to impact significantly on otter foraging ability given the location of the Proposed

Development in relation to these likely territories and the numerous other opportunities for foraging in the wider surrounding area.

- 9.7.9 Adverse operational effects on the otter population associated with the Proposed Development are possible. Otters tend to be crepuscular or nocturnal in freshwater situations, although this is perhaps less the case in Shetland because they are used to foraging on the coast in relation to tidal movements rather than in relation to daylight. However, it may be that otter movement on both burns will tend to be more at night time. There is a previous record of an otter mortality, probably connected to the existing B9075 and a traffic accident. There will be a period during construction of the wind farm when the Proposed Development is in use as well as the public road and levels of traffic will be greater. It was clear from otter pathways found during surveying that the existing public road currently has otter crossing it above both burns. In the longer-term traffic is likely to move on to the new road only, which will not make any difference to the existing Burn of Weisdale crossing but could make a positive difference to the Burn of Pettawater.
- 9.7.10 The level of traffic associated within the Proposed Development, once returned to public use, is not predicted to increase over and above that which the existing B9075 currently carries. Consequently, disturbance to otter and the potential for road related fatalities is likely to be similar or improved when compared to the existing B9075.
- 9.7.11 Maintenance of the realigned carriageway and the associated bridges will be required occasionally during the life time of the Proposed Development. Such activities will predominately be away from areas of otter activity (with the exception of works related to the two bridges) and will tend to be completed during daylight hours. It is unlikely that any regular maintenance will be required to bridge structures, however, if required, the disturbance to any otter utilising the area is likely to be of a short duration and probably not in a central territory area.
- 9.7.12 Prior to mitigation being considered, the magnitude of effect in relation to both the construction and operational phases of the Proposed Development on otter is predicted to be low. Consequently, the overall significance of the effect to the species during the construction and operational phase of the Proposed Development is assessed as Moderate/Minor. Through professional judgement this has been graded as Moderate, and significant prior to consideration of any mitigation measures.

Cumulative Effects on Otter

- 9.7.13 There is a temporary construction compound and a new access track with a new bridge over the Burn of Weisdale proposed close to the existing Kergord junction on the B9075. This other linked development could affect a potential otter holt identified in the 2019 otter survey but outside of the construction boundary for the Proposed Development. If the potential holt is proved to be an active holt (likely to be non-breeding) at the pre-construction stage then detailed consideration of its location will need to be undertaken because it is possible that the proposed construction compound and the building of the new Kergord access track (both separate consents to this development), could be within 30m of it. Current indications are, if proven active that an SNH development licence would be required in relation to those developments, for disturbance only. It is likely that the holt can be protected from any direct impact. Discussion would need to be held with the main contractor in relation to this and maintaining an adequate exclusion zone, under licence, should this holt be found to be active.

- 9.7.14 On current information and prior to anti-disturbance mitigation being considered, the magnitude of effect in relation to disturbance during the construction phases of the Proposed Development and the linked development in this area on otter is predicted to be Low. Consequently, the overall significance of the effect to the species during the construction and operational phases of all the linked developments in this local area is assessed as Moderate and significant, prior to mitigation.

Review of Other Important Ecological Features

Vegetation and Ground Water Dependent Terrestrial Ecosystems

- 9.7.15 In the previous application the unmitigated effect significance (Table 9.9, see Appendix 9.1) for all communities, for both construction and operation phases, also takes into account the potential impact on GWDTEs. The overall permanent footprint of the Proposed Development and the surrounding construction disturbance to vegetation is likely to be very similar for the Proposed Development as it was for the 2016 ES (VEWF, 2016). The total amount of habitat loss is estimated to be around 8.9ha (see Table 9.1 below). The alignment of the new road will generally be slightly further north than the 2016 application (see Figure 3.1).
- 9.7.16 The following Table (Table 9.1) has been extrapolated from Table 9.7 and Table 9.9 (see Appendix 9.1).

Table 9.1: The Habitat Loss of NVC Communities and their GWDTE Potential for the 2016 Application

NVC Community	GWDTE Potential	Total Habitat Loss (ha) Temporary + Permanent
M17 <i>Trichophorum cespitosum</i> – <i>Eriophorum vaginatum</i> blanket mire	-	2.9
U4 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Galium saxatile</i> grassland	-	2.7
M15 <i>Trichophorum cespitosum</i> – <i>Erica tetralix</i> wet heath community	Moderate	0.54
M19 <i>Calluna vulgaris</i> – <i>Eriophorum vaginatum</i> blanket mire	-	1.4
U6 <i>Juncus squarrosus</i> – <i>Festuca ovina</i> grassland	Moderate	0.7
H10 <i>Calluna vulgaris</i> – <i>Erica cinerea</i> heath	-	0.21
M23 <i>Juncus effusus</i> / <i>acutiflorus</i> – <i>Galium palustre</i> rush-pasture	High	0.2
U2 <i>Deschampsia Flexuosa</i> grassland	-	0.01
M10 <i>Carex dioica</i> – <i>Pinguicula vulgaris</i> mire	High	None
M28 <i>Iris pseudacorus</i> – <i>Filipendula ulmaria</i> mire	Moderate	None
M6 <i>Carex echinata</i> – <i>Sphagnum recurvum/auriculatum</i> mire	High	0.15
U5 <i>Nardus stricta</i> – <i>Galium saxatile</i> grassland	-	None
OV25 <i>Urtica dioica</i> – <i>Cirsium arvense</i> community	-	0.08
TOTAL (ha)	-	8.9

- 9.7.17 The only vegetation related receptor predicted to have a significant unmitigated effect (Moderate) under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 is the M17 *Trichophorum cespitosum* – *Eriophorum vaginatum* blanket mire community. Table 9.1 above indicates that this would be a total loss of 2.9ha, equating to 7% of the total for this habitat type present within the study area. This habitat does not have GWDTE potential. While this habitat has an International conservation

status, it is a common habitat type in Shetland and Scotland as a whole, covering large areas of moorland/bog. Comparing Figure 9.3 from the 2016 ES (see Appendix 9.2) with Figure 3.1, it can be seen that the precise proportions of M17 affected will only change by a very small amount, the total amount of M17 affected may well decrease slightly with the Proposed Development (estimated as 2.7ha in total). Any change in the area of M17 affected by the Proposed Development is inconsequential to the assessment. While there may be small changes in the area of other habitats lost to the Proposed Development, considering the areas involved and their conservation status, such changes are also inconsequential to the assessment.

- 9.7.18 The four GWDTE habitats that would have lost land under the previous application are marked in grey in Table 9.1. Comparing Figure 9.3 from the 2016 ES (see Appendix 9.2) with Figure 3.1, it can be seen that the area of M23 *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture lost will increase to accommodate the larger junction at the east end of the new alignment, by up to 0.4ha (up to 0.6ha total area). M23 has High GWDTE potential and in this area any groundwater flow would be approximately parallel to the new road alignment and unlikely to affect any further areas of M23. M23 is a very common habitat type, it is often species poor and of low interest from a botanical perspective. In this case, an increase in the area of M23 lost is not important from either a GWDTE or a botanical perspective and this variation will not alter the findings of the previous assessment. The M6 *Carex echinata* – *Sphagnum recurvum/auriculatum* mire present also has a High GWDTE potential. While the amount of M6 habitat present in the study area is small, in the wider surrounding area it is commonly occurring as similar small habitat areas. Comparing Figure 9.3 from the 2016 ES (see Appendix 9.2) with Figure 3.1, it can be seen that the very small areas of M6 follow flush lines and while the Proposed Development will cross them, one will be less affected, while one will be more affected. Overall the total area of M6 habitat affected will be similar to the previous application (estimated at a total of 0.15ha), and considering the areas involved and their conservation status, any change is inconsequential for the assessment.
- 9.7.19 The Moderate GWDTE habitats (shaded light grey in Table 9.1), M15 *Trichophorum cespitosum* – *Erica tetralix wet heath* and U6 *Juncus squarrosus* – *Festuca ovina* grassland, both had small areas in the previous application which would be affected (see Table 9.1 above). The M15 wet heath will now be completely avoided by the alignment being slightly further north at the east end but to the west of Lamba Scord the southern edge of a larger area of M15 will now be crossed. If there is an element of ground water dependency to this habitat, the Proposed Development should not affect it because there is a slight downward slope to the south as well as to the east in this area. Although the overall area of M15 affected will be slightly greater (estimated at up to 0.9ha) this will have no effect on the result of the previous assessment. The U6 grassland is an extremely common habitat in Shetland and in Scotland, it also has Moderate GWDTE potential. In Shetland it is generally a fairly species poor habitat. Comparing Figure 9.3 from the 2016 ES (see Appendix 9.2) with Figure 3.1, it can be seen that the Proposed Development will cross a lot less U6 due to its alignment being slightly further north, however, a larger area of U6 could still be indirectly affected due to the slope direction and groundwater flow being interrupted. Therefore, it is accurate to say that a similar area of U6 is likely to be affected overall by the Proposed Development to that estimated for the previous application (0.7ha).
- 9.7.20 M10 *Carex dioica* – *Pinguicula vulgaris* mire and M28 *Iris pseudacorus* – *Filipendula ulmaria* mire habitat will continue to be unaffected by the Proposed Development, as they were

with the 2016 ES (see Table 9.1). As per the previous assessment, no potential GWDTE habitats will have a significant unmitigated effect. All the GWDTE habitats are at a maximum of a Low magnitude of potential impact and a maximum predicted unmitigated significance of effect of Minor.

Watercourses

- 9.7.21 For the Proposed Development the Burn of Pettawater would require a new bridge to be built over it (as was the case with the 2016 application). The existing bridge over the Burn of Weisdale will not be altered. There is the potential for both burns to be adversely impacted by construction related run-off (water pollution) and run-off during temporary use of the new road during the wind farm construction phase. It is also possible that longer-term operational maintenance of the new bridge could cause impacts on the watercourse but this is thought to be low risk and unlikely. The design of the new bridge is such that no construction works will occur within or immediately adjacent to the channel, which lessens the risk of direct impacts on the Burn of Pettawater.
- 9.7.22 The unmitigated impacts to fish (assessed as being up to of International importance) were predicted to be Moderate/Minor Adverse, however, through professional judgement this was finalised as Minor given the low magnitude of the construction impacts and the limited habitat suitability for a number of the species present. This assessment is also accurate for the Proposed Development.

9.8 Review and Update of Mitigation Measures

Introduction

- 9.8.1 All of the mitigation measures put forward in the 2016 ES for ecology (see Appendix 9.1), have been repeated below, as long as they are still relevant for the current proposals. In addition, any new mitigation measures deemed necessary as part of this assessment (e.g. those for otter) are also included below.
- 9.8.2 Mitigation measures should only be used if complete avoidance of ecological impacts is not possible. Mitigation measures should be used to reduce the level of impacts and risk as much as possible. They can also be used as compensation for remaining effects, if necessary and likely to be successful.
- 9.8.3 It is important that mitigation measures relating to the overall design of the planned works and the Method Statements prepared for construction are implemented fully to minimise the effects on all important ecological features. For example, these will include ensuring that there are no insurmountable physical barriers to otter and fish movements in the area of the new bridge over the Burn of Pettawater, as well as detailed pollution prevention measures, including contingency plans (which are included within the Construction Environment Management Plan (CEMP) for the Proposed Development), which the contractor will be required to implement.
- 9.8.4 The mitigation measures detailed in this section are designed to reduce the impacts and resulting effects of the Proposed Development further. Detailed mitigation measures will also be included in the CEMP, based on the information contained in this EIA Report, and taking into account any additional requirements as part of consent conditions (Planning

Conditions) and the findings of pre-construction surveys. An experienced ECoW will also provide input into the final version of the CEMP prior to construction commencing.

Pre-construction Surveys

- 9.8.5 Pre-construction surveys will be carried out to mitigate against disturbance to and the potential destruction of otter resting places (offences under the Habitat Regulations 1994 (as amended) and the Wildlife and Countryside Act 1981 (as amended)). This is the only specially protected non-avian species which could be directly affected by the Proposed Development. Otters use multiple holts and couches within their ranges and may use new ones or currently inactive ones between the January 2019 survey and construction works commencing. A targeted otter survey will therefore be carried out prior to commencement of construction works (preferably within 6 months of commencement), within a minimum of a 200m buffer zone around the site boundary at the watercourse crossing locations for the new road and other suitable habitat. As noted in the otter survey report (provided as a Confidential Annex) from January 2019, camera trapping (under an SNH survey licence) is likely to be necessary to check the status of any potential holt or other potential resting sites (couches) where evidence present is not conclusive. Camera trapping would require to be completed over a minimum of a month and preferably 6 weeks. Should any active structure or place used for shelter or protection by otters be discovered during the pre-construction surveys, and be within the relevant disturbance zone, an SNH development licence will be applied for prior to any works commencing. The licence application will detail all suitable mitigation and/or compensation works and would be agreed with SNH.

Programming of Work and Raising Contractor Awareness

- 9.8.6 Construction work programmes can take into account periods of high sensitivity for protected species, when necessary. For the site ecology (excluding birds) this is not currently viewed as necessary but if any changes occur which make this important then the ECoW can implement this through the main contractor. Certain work tasks could be scheduled to avoid specific periods and additional surveying to check the effectiveness of such measures would be undertaken as required.
- 9.8.7 As part of the CEMP requirements, the ECoW will provide ecological constraints training and raise construction staff awareness of specific ecological issues through both the main contractor's site induction process and regular toolbox talks. All new staff to the site will undergo an induction which will include discussion of the ecological sensitivities on the site, minimisation of disturbance and the legal implications of not complying with agreed working practices.
- 9.8.8 To reduce the likelihood of otter mortality and injury during construction and operation of the new road for construction traffic, on-site speed limits will be made and enforced. For protection of animals (particularly otter) from entrapment in open excavations, pipes and culverts all personnel will be required to ensure that safe exits and/or blocking of ends of pipes is undertaken at the end of every working day.

Minimising the Risks of Pollution and Sedimentation

- 9.8.9 The Sandwater SSSI immediately downstream of the Proposed Development will be treated, at all times, as being extremely sensitive to all forms of pollution, as will both the Burns and any culverts passing under the new section of the road. Mitigation including best

practice techniques detailed in Chapter 10 (Hydrology, Hydrogeology and Geology) and the CEMP will be fully adopted for all construction and initial operational works to ensure that water quality within and leaving the construction and operational area is maintained. To control pollution and sedimentation risk as far as is possible, all issues will be mitigated where they occur using best practice methods (e.g. the use of oil interceptors and impermeable hard stands for all generator and fuel supply areas and the use of lagoons, silt fencing and controlled safe vegetation spread for dirty water). Full implementation of a detailed pre-construction CEMP should ensure that direct and indirect pollution and sedimentation impacts on watercourses and their associated species are avoided.

Watercourse Crossings

9.8.10 The new bridge proposed over the Burn of Pettawater will be carefully designed and implemented to ensure the following is safeguarded:

- otter foraging habitat (no in-channel construction);
- continued otter movements under the new bridge during higher water levels (original banks retained to a minimum of 1:200 year flood level, horizontally and vertically);
- fish spawning and nursery areas (no in-channel construction); and
- fish movements within the catchment (no in-channel construction).

9.8.11 Best practice will be followed for all construction works, combined with appropriate hydrological mitigation (Appendix 4.2: Outline Draft CEMP and Chapter 10: Hydrology, Hydrogeology and Geology). The new road bridge will be built completely outwith the Burn of Pettawater with no disturbance to the immediate banks or the channel substrate. The bridge uprights and necessary digging out and foundations will be set back from the edge of the channel and these have been calculated on the basis of providing high enough retention of the undisturbed immediate banks on both sides of the burn to allow for a minimum of 1 in 200 year floods. Provided that the immediate banks are left undisturbed to a horizontal and vertical level great enough to provide a minimum of the 1:200 year flood level then it will not be necessary to provide additional otter mitigation in relation to the new bridge.

9.8.12 Culverts and drainage channelling will be necessary in relation to the new road during both construction and operation. To safeguard the Sandwater SSSI it is essential that this is designed to exactly replicate the volumes of water currently flowing towards the north end of the Sandwater, in their current locations. It is also important in the longer-term that flow speeds are not increased by ditching and culverting resulting in erosion and increased longer-term sedimentation. Some ditches and culvert ends may need to be fully lined with adequate clean stone to prevent erosion (see Chapter 10 Hydrology, Hydrogeology and Geology for further details). The ECoW will discuss the importance of these measures with the main contractor and ensure this is implemented during both construction and longer-term operation of the new road.

Micro-siting of Infrastructure and the Use of Exclusion Zones

9.8.13 To comply with relevant protected species legislation and for nature conservation purposes, the potential for temporary disturbance to otter during construction will be minimised as far as possible. 50m marked exclusion zones will be used for non-breeding otter resting-up sites, where possible, and this will only be decreased down to a minimum

of 30m, where the ECoW can be sure that disturbance will not occur. Adjacent to watercourses, access to the watercourses by personnel and machinery will be kept to an absolute minimum and will follow agreed plans and methods. The use of higher level lighting (above single storey height and not pointing directly down to the ground) in all work areas and compounds will not be allowed within 200m of watercourses or waterbodies, unless otherwise agreed by the ECoW. No artificial lighting will be used within 100m of watercourses and waterbodies, unless otherwise agreed by the ECoW. The lighting provisions are to minimise potential disturbance to otter passing though both burns and the north end of the Sandwater at dusk and during the hours of darkness.

- 9.8.14 The presence of an ECoW during pre-construction and construction phases will help to ensure that opportunities to avoid any unexpected ecological sensitivities during construction are identified and, where feasible, taken. Any micro-siting of construction works and timescale changes required to avoid such areas will be undertaken in consultation with the main contractor by the ECoW. Such micro-siting could be due to animal, plant or habitat constraints identified on site.

Habitat Reinstatement

- 9.8.15 Best practice techniques for vegetation and habitat reinstatement will be adopted and implemented in all areas of disturbed vegetation. Where vegetation is to be removed (with the exception of floating road sections), all vegetation turves will be carefully stripped and stored outside of the construction area and outside of any temporary peat storage. This will be undertaken prior to any vehicle tracking across all such areas of vegetation. Undertaking this will help to ensure that all vegetation turves can be fully restored with the aim of avoiding the need for seeding in all but a few small areas. Similarly, surface peat (acrotelm) will be stored separately from deep peat (catotelm) and the two layers will be restored in the order they were excavated to try to ensure that surface peat is returned on top of deep peat. The depths to be excavated of different types of peat will be determined by the ECoW, depending on local circumstances, and agreed with the main contractor at the start of all stripping operations. Early reinstatement of all disturbed areas will be undertaken where possible to minimise the effects of soil and peat erosion and maximise the success of turf reinstatement. Any seed that is necessary for reinstatement will be fully agreed with the ECoW prior to any use on site. All reinstatement techniques, appropriate to the Proposed Development, will be detailed in the CEMP, and will all be implemented in consultation with the ECoW.

Construction Monitoring

- 9.8.16 During construction, continuous monitoring of otter/otter signs of use will take place. To ensure the full implementation of appropriate mitigation measures and monitoring requirements, an ECoW will be on site for the pre-construction and construction phase of the Proposed Development. The ECoW will monitor the EIA Report/CEMP compliance of all the proposed mitigation measures for ecology.
- 9.8.17 There is a Water Quality Management Plan (WQMP) for the construction of the Viking Wind Farm. This monitoring will also be used in relation to the Burn of Weisdale, the Burn of Pettawater and Sandwater SSSI. Specifically, the Burn of Weisdale has a sampling point just downstream from the existing B9075 road bridge (HU 4010 5471), as well as two much further upstream. The current sampling points on the Burn of Pettawater are both upstream of the Proposed Development but an additional sampling point will be added

immediately upstream of the existing B9075 road bridge. There are also three sampling points currently detailed for Sandwater (north shore, middle and south end of the loch). For Sandwater diatoms will be monitored, as well as hydrochemistry. These monitoring points are due to be sampled and tested once a month pre and during construction of the Proposed Development. This will allow measures such as pH, conductivity, turbidity and alkalinity to be tested regularly, as well as other chemical parameters. In addition, the ECoW can also test a more limited range of chemical determinants on an ad-hoc field sampling basis, these parameters include pH, conductivity and turbidity.

Habitat Compensation

- 9.8.18 There will be a small loss of blanket bog habitat (estimated to be 4.43ha in total, prior to any restoration for the total of the various NVC communities) in relation to the Proposed Development. The loss of approximately 2.7ha of M17 *Trichophorum cespitosum* – *Eriophorum vaginatum* blanket mire has been judged to be significant under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Therefore, mitigation or compensation should be undertaken to minimise the level of this impact. A Habitat Management Plan, including for a blanket bog enhancement scheme, has been committed to for the main wind farm and includes for 260ha of damaged bog enhancement. This area is greater than the combination of the replacement area of the Proposed Development bog and all the wind farm areas. This enhancement of existing degraded bog habitat will aim to return it to actively accreting bog with the diversity of micro-habitats/plant communities that would support.

9.9 Residual Effects

Sandwater SSSI

- 9.9.1 The SSSI is adjacent to the Proposed Development and while there is potential for negative impacts on it during construction and initial operation, the risk of these can be satisfactorily minimised and controlled. As discussed in Section 9.7, the potential and likely effects detailed above in relation to the Sandwater SSSI can all be minimised through both temporary and permanent drainage design of the new road and best practice construction techniques. This includes the use of best practice pollution prevention measures detailed in Chapter 10 (Hydrology, Hydrogeology and Geology) and Appendix 4.2: Outline Draft CEMP, which will be implemented by the main contractor and overseen by the independent site ECoW. In addition, but not a replacement for prevention, water quality monitoring of the Burn of Pettawater and Sandwater itself would be expected to alert the ECoW to any less visible concerns which could then immediately be raised with the construction team.
- 9.9.2 Accounting for full implementation of all the mitigation measures committed to, it is considered unlikely that a serious pollution incident would/could occur that would result in damage to the SSSI. It is straightforward, in engineering terms, to ensure that the design and construction of the new bridge, drainage and culverts maintain the existing hydrological inflows to the loch. With all these assurances in place and these being carried through to construction, and immediate operation, the residual effect on Sandwater SSSI, as a result of the Proposed Development is assessed as Minor Adverse, and not significant.

Otter

- 9.9.3 As discussed in Section 9.7, the potential and likely effects detailed above in relation to otter can all be minimised through good practice design and mitigation measures. A repeat otter survey will also be completed at pre-construction stage with camera monitoring as necessary, and an Otter Protection Plan will be formulated and used for construction of the Proposed Development, along with SNH development licensing, should it be required. In addition, an ECoW will oversee the pre-construction and construction works for the Proposed Development in relation to otter (and pollution prevention). Mitigation including control of lighting and trapping hazards will be implemented on the construction site. The new road bridge will be built completely outwith the Burn of Pettawater with no disturbance to the immediate banks or the channel substrate. The bridge uprights and necessary digging out and foundations will be set back from the edge of the channel and these have been calculated on the basis of providing high enough retention of the undisturbed immediate banks on both sides of the burn to allow for a minimum of 1 in 200 year floods.
- 9.9.4 Taking into account the mitigation summarised above and fully provided in the Mitigation section of this chapter (Section 9.7), it is considered that additional disturbance and/or additional mortality risk to otter, or a serious pollution incident affecting otter, can be minimised. However, during construction and initial construction use of the Proposed Development, in relation to noise and lighting, slight disturbance to otter is possible and this would be at a low magnitude. In the longer-term (post wind farm construction), improvement in the passage of otter beneath the new bridge over the Burn of Pettawater would be likely to achieve a longer-term decrease in road fatalities and would be beneficial.
- 9.9.5 During both construction and operation of the Proposed Development, accounting for all mitigation being fully implemented, significance of effect for otter as a result of the Proposed Development is anticipated to be Minor Adverse, and not significant.

Cumulative Effects on Otter

- 9.9.6 Taking into consideration that the Proposed Development and the other Viking Wind Farm infrastructure are all linked developments under the same Developer and likely under the same main contractor then there is confidence that any cumulative effects in relation to otter will be fully considered and safeguarded. At pre-construction stage it is likely to be the same ECoW who will be involved with all works in this area and therefore updated otter surveying for the Proposed Development and for the potential holt which could be affected by the linked developments, can be undertaken together. Should this holt be found to be active, then SNH will be contacted and a licence applied for at the pre-construction stage. Given the size of this otter territory on the Burn of Weisdale, with the mitigation proposed during the construction of the Proposed Development and the same level of mitigation (as best practice) for the linked wind farm developments, the potential cumulative effect on otter is assessed as being of Low magnitude at most, and Minor Adverse overall. Therefore, cumulative effects on otter would not be significant.

Review of Other Important Ecological Features

Vegetation and Ground Water Dependent Terrestrial Ecosystems

- 9.9.7 As detailed in the separate Mitigation section in this chapter (Section 9.7), blanket bog restoration under a Habitat Management Plan will ensure that mitigation is undertaken to compensate for the small loss of blanked bog for the Proposed Development. Blanket bog restoration will also, indirectly, benefit some potentially groundwater dependent habitats such as M6 *Carex echinata* – *Sphagnum recurvum/auriculatum* mire, which often grows in flush situations. The proposed Plan for blanket bog restoration is for a larger area of land than that for the predicted cumulative habitat loss for both the wind farm and the related works including the B9075 Sandwater Road.
- 9.9.8 Accounting for all likely impacts and all mitigation/compensation proposed, the residual effects in the 2016 ES for vegetation, including GWDTEs, were predicted to be no greater than Minor Adverse and not significant. The slight change in the alignment of the new road for the Proposed Development will not result in any significant changes to the vegetation affected, including the GWDTEs. Therefore, the level of construction and operational impacts, and resulting effects on vegetation would be very similar to the 2016 ES (see Appendix 9.1 for more details). This would result in residual effects for the Proposed Development assessed as no greater than Minor Adverse and not significant.

Watercourses

- 9.9.9 Robust mitigation is always very important for pollution control during construction, as is bridge design, to minimise habitat loss and severance. For the Proposed Development the Burn of Pettawater would require a new bridge to be built over it (as was the case with the 2016 application). The existing bridge over the Burn of Weisdale would not be altered. There is the potential for both burns to be adversely impacted by construction related run-off (water pollution) and run-off during temporary use of the new road during the wind farm construction phase. In relation to these aspects, mitigation measures were committed to in the 2016 ES and have been taken forward into the Proposed Development. The Construction Environmental Management Plan (CEMP) will also be an important document for the main contractor to implement fully in relation to the potential for water pollution. Design and implementation of this new bridge will conform to best practice standards and will be built completely outside of the watercourse and immediate banks to minimise all impacts. Accounting for the full implementation of these design and mitigation measures, the Proposed Development has been assessed the same as the 2016 ES. Watercourses (including habitat, fish and invertebrates), for both construction and operational effects would have a residual assessment of Minor Adverse and not significant in relation to the Proposed Development.

9.10 Overall Conclusions

- 9.10.1 Provided that all the mitigation and compensation detailed in this chapter is implemented then there are not likely to be any significant effects on ecology for the Proposed Development. Overall, a residual assessment of Minor Adverse and not significant under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 applies to the important ecological features in the area of the Proposed Development.

- 9.10.2 In addition to the impact assessment, Sandwater SSSI and otter present in the area are fully recognised as being sensitive in relation to the Proposed Development. The full implementation of all the mitigation measures detailed in this chapter will help to ensure that all construction and operational risks to them are fully recognised and minimised.

9.11 References

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