

Dean Moor Solar Farm

Environmental Statement: Appendix 8.1 – Preliminary Ecological Appraisal (PEA) and Great Crested Newt (GCN) Report

on behalf of FVS Dean Moor Limited

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DEAN MOOR SOLAR FARM APPENDIX 8.1: PRELIMINARY ECOLOGICAL APPRAISAL AND GREAT CRESTED NEWT REPORT PLANNING INSPECTORATE REFERENCE EN010155 PREPARED ON BEHALF OF FVS DEAN MOOR LIMITED

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1 Executive summary

- 1.1.1 Stantec UK Ltd was commissioned by FVS Dean Moor Limited to undertake a Preliminary Ecological Appraisal ('PEA') in connection with the Dean Moor Solar Farm (the 'Proposed Development'). In parallel to the PEA, the following surveys were also conducted, and the results presented in this report: great crested newt surveys, preliminary bat roost assessment, and winter bird characterisation survey.
- 1.1.2 The purpose of the PEA is to provide preliminary baseline information about the likely / potential ecological interest of the Site, further survey recommendations, and early comment on potential constraints and opportunities associated with the potential ecological interest of the Site. The PEA was carried out with reference to the Chartered Institute for Ecology and Environmental Management ('CIEEM') guidelines for preliminary ecological appraisal (CIEEM 2017), and included a desk study, and extended habitat survey.
- 1.1.3 The Site is predominantly pasture that is grazed by cattle and sheep. It is generally drained by a series of unnamed minor watercourses which run broadly south to north and west to east in the southern part of the Site.
- 1.1.4 A number of statutory designated sites are present near to the Site, including the River Derwent and Bassenthwaite Lake Special Area of Conservation ('SAC') / Site of Special Scientific Interest ('SSSI') and Solway Firth Special Protection Area ('SPA'). Further surveys and assessment (including a Habitats Regulations Assessment ('HRA')) are recommended to fully understand potential effects to these receptors.
- 1.1.5 Dean Moor County Wildlife Site ('CWS') is partially located within the Site. The layout of the Proposed Development should avoid direct impacts to Dean Moor CWS, where possible. It is recommended that further botanical survey information is secured in respect of Dean Moor CWS, to fully assess the potential for effects on the interest features. The potential for the enhancement of the CWS through the implementation of appropriate



management should be considered, and subject to agreement with stakeholders.

- 1.1.6 There is potential for direct impacts to notable habitats such as ancient woodland and hedgerows, and other habitats of ecological value such as plantation woodland, and ponds although these can be avoided by designing appropriate stand-off distances from development activities.
- 1.1.7 Presence of or potential for a number of notable species has been identified. Further surveys are recommended for:
 - Otter and water vole;
 - Breeding and wintering birds;
 - Habitats; and
 - Roosting bats (if required).
- 1.1.8 A range of measures to mitigate impacts and provide ecological enhancements are recommended.

Disclaimer

This Executive Summary contains an overview of the key findings and conclusions. However, no reliance should be placed on any part of the executive summary until the whole of the report has been read.



2 Introduction

2.1 Overview

- 2.1.1 Stantec UK Ltd was commissioned by FVS Dean Moor Limited to undertake a PEA and great crested newt survey for the Dean Moor Solar Farm (the 'Proposed Development') project. The PEA was undertaken by Stantec approved supplier BSG Ecology. The Proposed Development is located on land located between the villages of Gilgarran and Branthwaite in West Cumbria (central Ordnance Survey ('OS') grid reference NY 04760 22926), from here on referred to as 'the Site'. The survey area for the PEA included land with the Site and surrounding area, where access was available.
- 2.1.2 The purpose of the PEA is to provide preliminary baseline information about the likely / potential ecological interest of the Site, further survey recommendations, and early comment on potential constraints and opportunities associated with the potential ecological interest of the Site. This can be used to inform the scoping of future survey work and the ecological impact assessment, as well as the design of the Proposed Development, which has not yet been confirmed.
- 2.1.3 The advice set out with this PEA report is advisory and should not be used to inform planning.

2.2 Site location and description

- 2.2.1 The Site is 279.5 hectares ('ha') in area and is located between the villages of Gilgarran and Branthwaite in West Cumbria. The Site is bisected by a minor road that runs between Gilgarran and Branthwaite Edge. The Site lies entirely within the administrative area of Cumberland Council.
- 2.2.2 The Site can be viewed on the figures in **Section 7**.
- 2.2.3 The Site is predominantly pasture that is grazed by cattle and sheep. It is generally drained by a series of unnamed minor watercourses which run



broadly south to north and west to east in the southern part of the Site. The watercourses coalesce near Branthwaite Rigg and flow north to ultimately join the River Derwent.

- 2.2.4 The land within the Site has a varied topography with steep-sided hills associated with Thief Gill in the southern-central section part of the Site; and flat land to the north, east and west. Small sections of plantation woodland are present in the northern part of the Site.
- 2.2.5 Land surrounding the Site is dominated by grazing pasture and arable farmland, with large areas of plantation woodland also located north, east and west of the Site.

2.3 Proposed development

- 2.3.1 The Proposed Development comprises the proposed construction, operation and maintenance, and decommissioning of a renewable energy generating project on 279.5 ha of land between the villages of Gilgarran and Branthwaite in West Cumbria.
- 2.3.2 The Proposed Development has an expected energy generating capacity in excess of the 50MW threshold for onshore generating stations in England and therefore constitutes a 'nationality significant infrastructure project' ('NSIP'). The Applicant intends to make an application for a Development Consent Order ('DCO') to authorise the Proposed Development.
- 2.3.3 Detailed development plans for the Proposed Development are unavailable at the time of writing this report.



2.4 Report objectives

- 2.4.1 The objectives of this report are to:
 - Outline survey methodologies and relevant survey guidance;
 - Detail the results of the survey;
 - Discuss the results in relation to relevant legislation and planning policy (impacts); and
 - Outline recommendations (further surveys, avoidance/ mitigation/ compensation/ enhancements) as required.



3 Methods

3.1 Overview

3.1.1 The section below sets out the methodology used to inform the PEA. This included a desk study, and extended habitat survey. Details of survey limitations and survey personnel are also included.

3.2 Survey area

3.2.1 The survey area encompassed the Site and surrounding land, where access was available. The survey area can be viewed on the **Habitat** survey plans in Section 8.

3.3 Desk study

- 3.3.1 The desk study was carried out with reference to the CIEEM guidelines for preliminary ecological appraisal (CIEEM 2017). Data relating to the presence of statutory and non-statutory designated sites, species records, and information relating to the Site itself were gathered from public and private sources. Data from Cumbria Biodiversity Centre was obtained in May 2023.
- 3.3.2 For the desk study, the proposed search areas consist of the following search radii from the Site boundary:
- 3.3.3 10km radius from the Site boundary for internationally designated sites, to be extended beyond this radius where any hydrological pathways from the Site to the designated site are known to occur;
- 3.3.4 2km radius from the Site boundary for all other statutory and non-statutory locally designated sites;
- 3.3.5 2km radius from the Site boundary for notable habitats, including ancient woodland and Habitats of Principal Importance; and
- 3.3.6 2km radius from the Site boundary for protected species records.



3.3.7 In addition, an ecology and ornithology impact assessment produced in support of the wind turbine development within the Site was reviewed, particularly in relation to bird and bat surveys conducted in 2011 and 2012 (Airvolution Energy, Potato Pot Wind Farm ES, Chapter 6, Ecology and Ornithology, chapter undated).

3.4 Extended habitat survey

3.4.1 Habitats within the survey area were mapped in accordance with UK Habitat Classification System ('UKHab') (Butcher et al., 2020)). The survey was then "extended" to include an appraisal of the habitats' suitability for protected species. This included a search for signs of protected species or the species themselves. Such signs, and habitat features suitable for protected species were where, necessary, target noted. The survey was undertaken with reference to the CIEEM PEA guidelines (CIEEM 2017).

Table 3.1: Survey details.

Date	Cloud cover (oktas)	Temperature	Wind speed	Precipitation
26.04.23	3	10oC	2F	None

3.4.2 During subsequent visits to undertake other species-specific surveys, elements of the PEA were updated.

3.5 Bat roost potential

- 3.5.1 Trees within the survey area were inspected from the ground to assess their potential for supporting roosting bats. Features suitable for roosting bats including flaking bark, rot holes, cracks and splits in major limbs, and woodpecker holes were all noted (Collins, 2016; BTHK, 2018). The survey excluded areas of plantation woodland which would not be affected by the Proposed Development.
- 3.5.2 Farm buildings were externally inspected from the ground and a preliminary assessment made with reference to Bat Conservation Trust



('BCT') guidance (Collins, 2016; in particular Chapter 5). A detailed assessment was not completed as it is understood these buildings are to be retained.

3.6 Bat habitat assessment

3.6.1 The potential suitability of the survey area for bats was considered in relation to commuting or foraging, with reference to Bat Conservation Trust guidance (Collins, 2016; in particular Table 4.1 in Chapter 4).

3.7 Wintering bird characterisation survey

- 3.7.1 Two wintering bird characterisation surveys have been undertaken using a walkover methodology (Bird Survey & Assessment Steering Group website). During each survey each point within the survey area was approached to within 50m. Where multiple species were observed at once, the surveyor made short stops to ensure the full range of species and behaviour were recorded. Birds and their behaviours were recorded using standard British Trust for Ornithology ('BTO') notation.
- 3.7.2 A summary of the survey conditions is presented below in **Table 3.2.**

Date	Timing	Sunrise	Temperature	Wind speed (Beaufort Force)	Cloud Cover (Oktas)	Precipitation	Visibility
22/02/2023	09:00 - 14:00	07:20	6°c	1	1	Light drizzle	<2 km
23/03/2023	07:30 - 12:00	06:09	9°c	4	2	Dry	>2 km

Table 3.2: Wintering bird survey details.

3.8 Great Crested Newt

3.8.1 The survey area and a buffer 250m around it were initially assessed using aerial photographs and OS maps for the presence of small, non-flowing waterbodies that were considered to have potential suitability to support



breeding great crested newt ('GCN'). Six ponds were identified either within the survey area or the surrounding 250m area.

- 3.8.2 Four ponds (Pond 1 4) were taken forward for further survey. Two ponds to the east of the Site were not surveyed due to access constraints.
- 3.8.3 The location of the Ponds 1 4 is described in **Table 3.3** below and shown on the Habitat Survey Plans, Section 8.
- 3.8.4 The Ponds were assessed for their potential to support great crested newt using the Habitat Suitability Index ('HIS') scoring method (Oldham et al., 2000) on 5 May 2022. HSI assessment is a quantitative means of evaluating habitat quality for great crested newt and is measured using ten indices. An overall score is obtained for a pond between 0 and 1 with a score of 1 representing optimal conditions for breeding GCN.
- 3.8.5 Water samples were then collected from Ponds 2, 3 and 4 on 26 April 2023, and from Pond 1 on 24 May 2023. The water samples were subject to environmental DNA ("eDNA") sampling and analysis for great crested newt. This was undertaken within the recommended survey period (mid-April to the end of June). A total of 20 samples were taken from each pond using a sampling kit provided by Sure-screen and using the standard sampling method (Biggs et al., 2014), which were labelled and sent for analysis.

Pond reference	Ordnance Survey grid reference
Pond 1	NY 03626 24695
Pond 2	NY 04070 23951
Pond 3	NY 0474224071
Pond 4	NY 04220 22338

Table 3.3: Location of Ponds.

3.8.6

Concurrently with the eDNA survey, a single GCN survey visit was undertaken in accordance with published guidelines (Langton et al., 2001). Three survey methods (egg searches, torch surveys and bottle trapping)



were used to survey Ponds 2 - 4 (safe access was not possible to Pond 1). Survey details are shown in **Table 3.4** below:

Pond Surveyed	Date	Date Survey Methods Used Weather		
Ponds 2 & 3	26/04/2023	Egg searching, bottle trapping, torching and eDNA	5ºC, Dry, F2	
Pond 4	28/04/2023	Egg searching, bottle trapping, torching and eDNA	16°, Dry, F2	
Pond 1	24/05/2023	eDNA	16º, Dry, F2	

Table 3.4: GCN survey timings and conditions

3.9 Survey Personnel

- 3.9.1 Surveys were led by Senior Ecologist Josh Havlin ACIEEM of BSG Ecology. Josh has worked in the ecology sector since 2016 and has completed preliminary ecological appraisals on a wide range of sites in the UK.
- 3.9.2 This report was drafted by Hannah Breadin ACIEEM, Senior Ecologist at BSG who has worked in the ecological sector for more than 9 years, with input from Josh Havlin.

3.10 Limitations

- 3.10.1 It was not possible to access the open water of Pond 1 during the newt survey due to dense reeds forming a floating vegetative mat between the banks and open water. As a result, the water that was sampled is the relatively shallow water from within the reed bed, with only around 25% of the perimeter of the open water being accessible. This is a limitation on the eDNA sampling, although it did not affect the results of the desk study or the HSI assessment of this pond.
- 3.10.2 Two ponds to the east of the Site were not surveyed for great crested newts due to access constraints. However, four ponds with and immediately adjacent to the site were surveyed meaning a reasonable



assessment of the likelihood of great crested newts being present within the Site could be made.

- 3.10.3 Wintering bird surveys cover February and March 2023. The aim of these surveys was not to complete a comprehensive assessment of the survey area by non-breeding wintering bird populations but to provide information to inform the scoping of more formal surveys that might be completed at a later stage and to support consultations with Natural England and other stakeholders in agreeing the level of survey work ultimately required. As such no limitation is identified.
- 3.10.4 The habitat survey was completed in April 2023 when botanical species may be dormant and undetectable. Most habitats within the survey area were agriculturally improved and of minimal botanical interest. However, some discrete areas of grassland which have the potential to be botanically diverse were present. This is not a significant constraint given the purpose of the report (a preliminary ecological appraisal) but further survey of these discrete areas is recommended within the core botanical growing period to confirm the interest of these habitats.

3.11 Report qualification

- 3.11.1 The survey described here was undertaken in accordance with the best practice methodologies current at the time of commissioning. Site circumstances, scientific knowledge or methodological requirements can change during the course of a project, and these external factors may impact on the scope of subsequent work requirements.
- 3.11.2 All survey work and reporting was undertaken by experienced and qualified ecologists, in accordance with the Code of Professional Conduct of the CIEEM.
- 3.11.3 All ecological surveys have an expected validity period owing to the tendency of the natural environment to change over time. This validity period varies from receptor to receptor and is also dependent on the degree of change in a site's management and overall landscape ecology.



Where the potential for change is considered to be relevant to the site, this is highlighted in the appropriate section.

3.11.4 This report does not purport to provide detailed, specialist legal advice.Where legislation is referenced, the reader should consult the original legal text, and/or the advice of a qualified environmental lawyer.



4 Results and interpretation

4.1 Overview

- 4.1.1 Information on designated sites, habitats and species are described below. The photographs referred to in the text below are presented in Appendix B.
- 4.1.2 Designated sites are shown on **Figure 1** and **Figure 2**, Habitats are show on **Figure 3**.

Statutory designated sites

Results and evaluation

4.1.3 Internationally designated sites present within 10km of the Site are described in **Table 4.1** below.

Site Name	Approximate Distance and Direction from Site	Reason for Designation	
River Derwent & Bassenthwaite Lake SAC	River Derwent & Bassenthwaite Lake SAC1.2km to the east (and hydrologically connected to the Site via watercourses)Designated for aquatic nabitats which the River Derwent and Ba Lake support, including lamprey Atlantic salmon, otter, marsh frit butterfly, and floating water plar		
River Ehen SAC	6.1km to the south	Designated for the presence of freshwater pearl mussel and Atlantic salmon.	
Solway Firth SPA	5km to the west	Designated due to its importance during winter for non-breeding waterfowl and non- breeding gulls.	
Lake District High Fells SAC	8km to the southeast	Designated for a range of upland habitats including heathland, tarns (waterbodies), grassland, bogs, scree, woodland, and tall herb communities.	
North Pennine and Dales Meadows SAC	8.9km to the east	Designated due to the presence of mountain hay meadows and <i>Molinia</i> meadows.	

Table 4.1: Internationally Designated Sites present within 10km of the Site

4.1.4 Nationally and locally designated statutory sites present within 2km of the Site boundary are described in **Table 4.2** below.



Table 4.2: Nationally Designated Statutory Sites present within 2km of	the
Site	

Designated Site Name	Approximate Distance and Direction from the Site Boundary	Reason for Designation
River Derwent and Tributaries SSSI	1.2km to the east (and hydrologically connected to the Site via watercourses)	Designated for aquatic habitats and species which the River Derwent and its tributaries support.

The Survey area falls within the Natural England Impact Risk Zone ('IRZ') for the designated sites listed in Table 7a, above. The IRZ indicates that planning applications for solar schemes with a footprint greater than 0.5ha could potentially have an adverse impact on the designated sites. It is assumed that these are also relevant for DCO applications.

The accompanying IRZ guidance (Natural England, 2021) states that local planning authorities ('LPAs') have a duty to consult Natural England before granting planning permission on any development that is in or likely to affect a SSSI. The SSSI IRZs can be used by LPAs to consider whether a proposed development is likely to affect a SSSI and determine whether they will need to consult Natural England to seek advice on the nature of any potential SSSI impacts and how they might be avoided or mitigated.'

Potential impacts and recommendations

- 4.1.5 River Derwent and Bassenthwaite Lake SAC and River Derwent and Bassenthwaite Lake SSSI (same footprint as the SAC). Given the distance (1.2 km) and the buffering that intervening habitats will provide, direct impacts on either the SAC or SSSI are not anticipated to arise from a solar photovoltaic ('PV') development.
- 4.1.6 Indirect impacts (the potential for airborne dust or other emissions to the air or water during construction to give rise to an adverse impact on designated sites) is possible and the potential requirement for a HRA in respect of the interest of the SAC should be considered / discussed with the planning authority and Natural England.
- 4.1.7 Likewise, the presence of otter (an interest feature of the SAC) on the survey area should be considered further in respect of the potential requirement for HRA. As discussed below in this report, otter has been recorded on and close to the survey area which is in the catchment of the River Derwent.



- 4.1.8 The North Pennine Dales Meadows SAC, Borrowdale Woodland Complex SAC, Lake District High Fells SAC and the River Ehen SAC are all located over 6km from the Survey area and as such direct impacts are considered unlikely. Indirect impacts may need to be considered further once detailed plans for the Proposed Development are available.
- 4.1.9 There is potential for impacts to the Solway Firth SPA through loss of habitat used by SPA birds, in particular those species which will utilise agricultural habitats such as lapwing and curlew, if they use the Site for foraging or roosting.
- 4.1.10 It is likely that a HRA will need to be undertaken to assess any likely significant effects to internationally designated sites. Natural England should be consulted with respect to the findings of the HRA at the earliest opportunity.

Designated Site Name	Approximate Distance and Direction from the Site Boundary	Reason for Designation
River Derwent and Tributaries SSSI	1.2km to the east (and hydrologically connected to the Site via watercourses)	Designated for aquatic habitats and species which the River Derwent and its tributaries support.

 Table 4.2: Nationally Designated Statutory Sites present within 2km of the

 Site

The Survey area falls within the Natural England Impact Risk Zone ('IRZ') for the designated sites listed in Table 7a, above. The IRZ indicates that planning applications for solar schemes with a footprint greater than 0.5ha could potentially have an adverse impact on the designated sites. It is assumed that these are also relevant for DCO applications.

The accompanying IRZ guidance (Natural England, 2021) states that local planning authorities ('LPAs') have a duty to consult Natural England before granting planning permission on any development that is in or likely to affect a SSSI. The SSSI IRZs can be used by LPAs to consider whether a proposed development is likely to affect a SSSI and determine whether they will need to consult Natural England to seek advice on the nature of any potential SSSI impacts and how they might be avoided or mitigated.'

Potential impacts and recommendations

4.1.11 River Derwent and Bassenthwaite Lake SAC and River Derwent and Bassenthwaite Lake SSSI (same footprint as the SAC). Given the distance (1.2 km) and the buffering that intervening habitats will provide, direct



impacts on either the SAC or SSSI are not anticipated to arise from a solar photovoltaic ('PV') development.

- 4.1.12 Indirect impacts (the potential for airborne dust or other emissions to the air or water during construction to give rise to an adverse impact on designated sites) is possible and the potential requirement for a HRA in respect of the interest of the SAC should be considered / discussed with the planning authority and Natural England.
- 4.1.13 Likewise, the presence of otter (an interest feature of the SAC) on the survey area should be considered further in respect of the potential requirement for HRA. As discussed below in this report, otter has been recorded on and close to the survey area which is in the catchment of the River Derwent.
- 4.1.14 The North Pennine Dales Meadows SAC, Borrowdale Woodland Complex SAC, Lake District High Fells SAC and the River Ehen SAC are all located over 6km from the Survey area and as such direct impacts are considered unlikely. Indirect impacts may need to be considered further once detailed plans for the Proposed Development are available.
- 4.1.15 There is potential for impacts to the Solway Firth SPA through loss of habitat used by SPA birds, in particular those species which will utilise agricultural habitats such as lapwing and curlew, if they use the Site for foraging or roosting.
- 4.1.16 It is likely that a HRA will need to be undertaken to assess any likely significant effects to internationally designated sites. Natural England should be consulted with respect to the findings of the HRA at the earliest opportunity.

Non-statutory designated sites

Results and evaluation

4.1.17 Dean Moor CWS is partially located within the Site and is shown onFigure 2. This CWS is designated for acidic moorland habitats.



4.1.18 There are a further 13 CWSs and three Special Roadside Verges within 2km of the Site.

Potential impacts and recommendations

- 4.1.19 The layout of the Proposed Development should avoid direct impacts to Dean Moor CWS, where possible. It is recommended that further botanical survey information is secured in respect of Dean Moor CWS, to fully assess the potential for effects on the interest features. The potential for the enhancement of the CWS through the implementation of appropriate management should be considered, and subject to agreement with stakeholders.
- 4.1.20 Effects on the interest of other non-statutory designated sites are unlikely to be significant if they are not directly impacted (i.e. if they are excluded from the development footprint). The potential impact of emissions to the air and water during the construction and decommissioning phases of the Proposed Development should be considered further.

4.2 Habitats

 4.2.1 Notable habitats identified through the desk study are shown on Figure 2 Non-Statutory Sites and Notable Habitats. All habitat identified during the site visit are shown on Figures 3a and 3b with Target Notes identifying features of interest (further detail on Target Notes is present within Appendix A).

Notable habitats

Lowland dry acid grassland

4.2.2 Slopes of the gorge containing Thiefs Gill on the southern boundary of the survey area feature grazed semi-improved acid grassland. The habitat is comprised of soft rush Juncus effusus, crested dog's tail (*Cynosurus cristatus*), mat-grass (*Nardus stricta*), common sorrel, lady's bedstraw (*Galium verum*), tormentil (*Potentilla erecta*), bilberry (*Vaccinium myrtillus*), and sheep fescue.



Hedgerow

4.2.3 Several hedgerows are present, dominated by hawthorn and blackthorn. Common tree species include ash, goat willow, English oak, alder and beech. One hedgerow on the southern part of the survey area (H7) is dominated by gorse Ulex europaeus. Common ground flora species include broad-leaved dock, dandelion, creeping buttercup, hairy bittercress, common nettle, rosebay willowherb, foxglove, bramble, gorse and honeysuckle. Dog-violet, creeping thistle, dog rose, lesser stitchwort *(Stellaria graminea),* hard fern, cleavers, spear thistle *(Cirsium vulgare)* and holly are also present.

Ancient woodland

4.2.4 Seven parcels of ancient woodland are present within 2km of the Site, the closest being located adjacent to the western part of the Site boundary in Area C. No ancient woodland is present within the Site.

Lowland heathland

4.2.5 An area of the lowland heathland is also mapped immediately adjacent to the west of the Site. No lowland heathland is present within the Site.

Other habitats

Modified grassland

4.2.6 Most fields on the southern half of the survey area are heavily grazed and are dominated by perennial rye grass (Lolium perenne). Soft rush (Juncus effusus) is present in damper areas, such as the shallow valley adjacent to the larger coniferous plantation woodland block and along watercourses. Other species present include common bent (Agrostis capillaris), creeping bent (Agrostis stolonifera), red fescue (Festuca rubra), sheeps fescue (Festuca ovina), rough meadow grass (Poa trivialis), Timothy Phleum pratense, sweet vernal grass (Anthoxanthum odoratum), hard rush (Juncus inflexus), white clover (Trifolium repens), creeping buttercup (Ranunculus repens), common nettle (Urtica dioica), broad-leaved dock



(Rumex obtusifolius), yarrow (Achillea millefolium), cuckoo flower (Cardamine pratensis), and hairy bittercress (Cardamine hirsute).

- 4.2.7 Whilst a range of species were found to be present, including several grass species, perennial rye grass was dominant across all fields with other grass species at much lower densities or being highly localised. Forb species were also sparse within the sward, which was found to be uniformly below 7cm in height across these fields. In addition, areas of bare ground were present indicative of poaching during wet weather.
- 4.2.8 Several of the fields on the northern half of the survey area contain a similar species composition to those in the southern half, though some also exhibit some key differences. Large swathes of these fields are dominated by soft rush and hard rush that appear to be regularly topped. Outside of the areas dominated by rushes, the habitat is dominated by perennial rye grass with occasional common bent, red fescue, Timothy, annual meadow grass (*Poa annua*), and rarely white clover, broad-leaved dock, cuckoo flower, common nettle, and hairy bittercress.
- 4.2.9 These fields are also heavily grazed, with areas of poached bare ground within the sward. The sward is, notwithstanding areas dominated by rushes, uniformly less than 7cm in height.
- 4.2.10 During a breeding bird survey in May 2023 (after the initial habitat survey in April 2023), some of the northern fields were found to contain several species of sedge that were not previously in evidence. These species include common sedge *(Carex nigra),* false fox sedge *(Carex otrubae),* and common spike-rush *(Eleocharis palustris).* The presence of these species indicates a higher level of diversity than was originally recorded, though a low diversity of forb species means that the grassland is not currently considered sufficiently distinctive to be recorded as other neutral grassland.

Other neutral grassland

- Other neutral grassland is dominated by soft rush, perennial rye grass, 4.2.11 tufted hair grass (Deschampsia cespitosa) and broad-leaved dock. Other commonly occurring species include creeping thistle (Cirsium arvense), common nettle, cocksfoot (Dactylis glomerata), creeping buttercup, Yorkshire fog (Holcus lanatus), common bird's-foot-trefoil (Lotus corniculatus) and angelica (Angelica sylvestris). Less common species present include curled dock (Rumex crispus), soft rush, hard rush, foxglove (Digitalis purpurea), common sorrel (Rumex acetosa), rosebay willowherb (Epilobium angustifolium), white clover, marsh thistle (Cirsium) palustre), dandelion (Taraxacum officinalis), silverweed (Potentilla anserina), common bent grass, white dead nettle (Lamium album), common spotted orchid (Dactylorhiza fuchsii), alder saplings (Alnus glutinosa), horsetail (Equisetum arvense), lesser celandine (Ranunculus ficaria), colt's foot (Tussilago farfara), gorse (Ulex europaeus), common ragwort (Senecio jacobaea), goat willow (Salix caprea), reed canary grass (Phalaris arundinacea) and bramble (Rubus fruticosus).
- 4.2.12 The grassland around Pond 1 is rank but found to be dominated by soft rush and Yorkshire fog with locally dominate areas of tufted hair grass.
 Less abundant species include common sorrel, Alexanders (Smyrnium olusatrum), common hogweed (Heracleum sphondylium), bramble, bracken (Pteridium aquilinum) and common ragwort.
- 4.2.13 An area of damp grassland was present in the southwest of the survey area, dominated by hard rush and other common species include meadow buttercup, soft rush (*Juncus effusus*), compact rush (*Juncus conglomeratus*), sharp flowered rush (*Juncus acutiflorus*), cuckoo flower, marsh thistle, dandelion, common sedge (*Carex nigra*), star sedge (*Carex echinata*), marsh bedstraw (*Galium tinctorium*), water forget-me-not (*Myosotis scorpoides*), hairy willowherb (*Epilobium hirsutum*), and broadleaved willowherb (*Epilobium montanum*).

Other woodland: broadleaved

- 4.2.14 Much of the northern part of the survey area is dominated by broadleaved plantation woodland. Canopy species consist of alder, goat willow (Salix caprea), silver birch (Betula pendula), English oak (Quercus robur) and ash (*Fraxinus excelsior*). Understory species include common cherry (Prunus avium), holly (Ilex aguifolium) and hawthorn (Crataegus monogyna). Ground layer species include common sorrel, soft rush, hard rush, curled dock, broad-leaved dock, marsh thistle, wild carrot (Daucus carota), Yorkshire fog, hairy willowherb (Epilobium parviflorum), creeping buttercup, meadow buttercup (Ranunculus acris), floating sweet-grass (Glyceria fluitans), bramble, cuckoo flower, horsetail, angelica, common bent grass, common bird's-foot-trefoil, common nettle, gorse, cleavers (Galium aparine), common spotted orchid, bracken, honeysuckle (Lonicera periclymenum), deer grass (Trichophorum germanicum) and (Pendulous sedge) (Carex pendula). A few conifers are present in the broadleaved woodland which include Scots pine (Pinus sylvestris), larch (Larix decidua) and sitka spruce (Picea sitchensis). Additionally, two area are damper: one has localized areas of wetness and the other has a damp ground layer with a high proportion of bryophytes and evidence of deer grazing. In the more extensive areas of this woodland, grassy rides are present. These were mapped as the appropriate grassland habitats.
- 4.2.15 The ground layer of broadleaved woodland on the slope is similar in composition to the semi-improved neutral grassland present elsewhere on the survey area.

Other woodland; mixed

4.2.16 A small mixed planation is present in the east of the survey area. Canopy species consist of Sitka spruce, alder, silver birch, Scots pine, common cherry, hawthorn (left to grow tall), hazel *(Corylus avellana)*, sycamore *(Acer pseudoplatanus)*, field maple *(Acer campestre)*, grey willow and English oak. Understory species are holly, bramble and blackthorn *(Prunus spinosa)*. Ground species present are tufted hair grass, soft rush,



marsh thistle, common sorrel, common nettle, Yorkshire fog, broad-leaved dock, creeping thistle, rosebay willowherb, lesser celandine, fox glove, common hogweed, common nettle and dandelion. Rhododendron *(Rhododendron ponticum)* is present in low concentration.

Felled woodland

4.2.17 A small section of woodland directly south of the mixed planation woodland has been recently felled.

Other woodland; coniferous

4.2.18 Two conifer plantations are present in the south of the survey area and are dominated by Sitka spruce. A sparse ground layer at the fringes of the conifer blocks contains broad-leaved dock, tufted hair grass, soft rush, red fescue, bracken, and gorse. No ground layer is present in the centre of the blocks due to lack of light. Two younger areas of recently planted coniferous plantation woodland are present on the southern slope.

Line of trees (UKHab equivalent: line of trees)

4.2.19 There is one line of trees present on the survey area and it is associated with a bank. Species include beech (*Fagus sylvatica*), alder, silver birch, elder (*Sambucus nigra*), hawthorn, bramble, ground elder (*Aegopodium Podagraria*), lesser celandine, herb Robert (*Geranium robertianum*), common heather (*Calluna vulgaris*), common nettle, meadowsweet (*Filipendula ulmaria*), cow parsley (*Anthriscus sylvestris*), angelica, soft rush, broadleaved willow herb (*Epilobium montanum*), hairy bittercress, hard fern (*Blechnum spicant*), Spanish bluebell (*Hyacinthoides hispanica*), dog rose (*Rosa canina*), dog-violet (*Viola riviniana*), daffodil (*Narcissus sp.*), white dead nettle, cleavers, gorse, fox glove, honeysuckle and crab apple (*Malus Sylvestris*).

Mixed scrub

4.2.20 Several areas of dense scrub are present, including on damper ground.Most areas are dominated by grey willow with occasional alder. Hawthorn scrub and gorse scrub are also present. Ground layer species are tufted



hair grass, soft rush, common bent grass, silverweed, dandelion, angelica, broad-leaved dock, daisy *(Bellis perennis),* ribwort plantain *(Plantago lanceolata)*, common hogweed, honeysuckle, marsh thistle, broad-leaved willowherb, marsh marigold *(Caltha palustris)* and hemlock water dropwort *(Oenanthe crocata).*

Flush

4.2.21 Two flushes are present in the gorge in the south of the survey area. These flushes were dominated by sun spurge (*Euphorbia helioscopia*), with soft rush, compact rush, and common nettle. The water table was near the surface at the time of survey.

Ponds

4.2.22 There are four ponds within the survey area. Pond 1 was partly inaccessible to surveyors as it is surrounded by 20m of swamp dominated by floating bulrush. Ponds 3 and 4 are surrounded by marshy grassland vegetation. Pond 3 also has an island in the middle of the pond with goat willow scrub.

Swamp

4.2.23 Swamp is present at the margins of Ponds 1 and 2, with a species composition of alexanders *(Smyrnium olusatrum),* water mint, floating sweet-grass, greater pond sedge *(Carex riparia),* marsh thistle, bulrush *(Typha latifolia),* meadowsweet, a horsetail and marsh bedstraw. Alder is scattered throughout the habitat. The water table is above ground.

Streams

4.2.24 The southern part of the survey area contains a series of watercourses. The main watercourse, Thief Gill, flows northwards from the southern boundary, through a steep-sided gorge, before discharging offsite via a culvert under the road on the eastern boundary. The watercourse is joined by two smaller watercourses.



- 4.2.25 A smaller watercourse flows down the western boundary of the southern part of the Site where it is joined by another watercourse flowing west from one of the coniferous plantation woodland blocks.
- 4.2.26 The watercourses appear (visually) to have poor water quality. The bed material is primarily cobbles, gravel, and silt, with the cobbles being well-impacted into the substrate.

Buildings

4.2.27 Two buildings are present within the survey area. The potential of these structures to support bats and breeding birds is discussed in the 'protected species' section of this report.

Potential impacts and recommendations

- 4.2.28 There is potential for direct impacts to notable habitats such as ancient woodland and hedgerows, and other habitats of ecological value such as plantation woodland, and ponds although these could be avoided by designing appropriate stand-off distances from development activities.
- 4.2.29 Grassland habitat will be lost although the extent of loss will be limited given the nature of the proposed development. It is assumed at this stage that the grassland beneath the solar arrays will be retained, although there is scope to manage the retained grassland less intensively. Grassland in the stand-off buffers along hedge lines has potential to be diversified and managed to benefit invertebrates, farmland birds and commuting / feeding bats.
- 4.2.30 The Proposed Development has the potential to adversely impact the watercourses a as a result of run-off, dust or any pollution events that could arise. These potential impacts would need to be assessed further once detailed proposals for the Proposed Development are available. However, it is likely that the implementation of best practice for works near watercourses would provide appropriate mitigation.



- 4.2.31 It is assumed that swamp, ponds and other habitats will be unaffected by the Proposed Development. Opportunities for further habitat creation (such as the creation of new wetland habitat) should be considered as the scheme evolves.
- 4.2.32 Removal of woodland, trees, hedges should be avoided, other than limited clearance to enable access, where required. The removal of habitats should be done sympathetically. For example, through the implementation of phased clearance of habitats to minimise impacts to species.
- 4.2.33 The Proposed Development's design should incorporate appropriate buffers between infrastructure development and sensitive habitats, such as watercourses and woodland. The enhancement of watercourses within the Site through the exclusion of livestock and the implementation of supplementary planting to reduce the erosion of banks and sediment input.
- 4.2.34 During the operational phase of the Proposed Development, the intensity of sheep grazing within the Site is likely to be reduced which will allow an improvement of habitat quality and diversity relative to the existing baseline conditions. In addition, this is likely to provide further enhancement to watercourses within the Site, and downstream, through a reduction in nutrients generated through agricultural activity entering these watercourses.

4.3 Species

4.3.1 Results of the desk study and field survey are presented below to determine the likelihood of protected or notable species to be present on-Site.



4.4 Bats

Results and evaluation

Bats - potential roosting assessment- buildings

- 4.4.1 Two agricultural barns are present on the southern half of the survey area.Building 1 is located at OS grid reference NY 05062 23343 and Building 2 is located at NY 05090 23334.
- 4.4.2 Both buildings feature pitched roofs of corrugated asbestos concrete sheeting and appear to be steel-framed. A breezeblock wall is built up to approximately 1.5m from the ground with the remaining walls of each side of the structure being constructed of wooden slats, with gaps between each piece of wood. The interior of the buildings is therefore open to the elements, reducing the suitability of the interior for roosting bats.
- 4.4.3 Whilst some potential roost features ('PRFs') may be present between the steel frame of the buildings and the wooden panelling / the roof sheeting, it is considered that these PRFs are unsuitable for bats due to the internal temperature and humidity conditions created by the overall nature of the buildings' construction. Building 1 and Building 2 are therefore assessed as being of negligible suitability for roosting bats.
- 4.4.4 A third building is located on the northern part of the survey area and is associated with the Potato Pot Windfarm (OS grid reference NY 04164 24756). This is a single-storey building of brick and mortar construction with a simple, slate-covered, pitched roof. The building has plastic fascias and soffits, which appear to be well sealed. No potential roost features were identified on the building and it is considered to be of negligible suitability for roosting bats.

Bats - potential roosting assessment- trees

4.4.5 The woodland areas of the survey area are predominantly young or early mature. The tree specimens within these habitats are typically uniform in age with narrow trunk diameters and lacking splits, cavities and aerial dead wood with the potential to support roosting bats. However, tree age



does not definitively rule out the presence of roosting bats (BTHK, 2018), and further survey would be needed should any of the early mature woodland areas be impacted by the Proposed Development.

- 4.4.6 A number of more mature trees were recorded along the road that divides the northern and southern parts of the survey area however, and these were noted to contain potential roost features.
- 4.4.7 Mature woodland is located outside the survey area to the west and this habitat is likely to contain potential roosting opportunities to bats.

Bats – general habitat assessment

- 4.4.8 The grazed grassland areas of the survey area are likely to provide lower suitability foraging habitat for bats (see, for instance, Brandt et al, 2007). However, the watercourses, ponds and areas of woodland have the potential to provide better foraging habitat. The habitat in the surrounding area is dominated by arable, pasture and upland heath, all of which is likely to be of lower foraging value. Overall, the survey area is likely to be of low to moderate potential for commuting and foraging bats.
- 4.4.9 The data search returned a limited range of bats from 17 individual records: "bat species", whiskered / Brandt's bat (*Myotis mystacinus / brandtii*), Daubenton's bat (*Myotis daubentonii*), noctule bat (*Nyctalus noctule*), pipistrelle bat species, common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), and brown long-eared bat (*Plecotus auratus*). Of the records supplied, approximately half appear to be records of roosting bats, with the largest being a 130-count "bat" roost near Gilgarron from 1991. The latest likely roost records are for a 50-count event in 2017 near Asby, to the south (pipistrelle species).
- 4.4.10 Surveys in 2012 to inform the wind farm development used Static bat detectors at three locations and these recorded low levels of bat activity at a maximum of 11.72 bat passes per hour at one of the detectors. Common pipistrelle was the most commonly recorded species and other species included pipistrelle species, soprano pipistrelle, *(Myotis sp.)*, Daubenton's



bat, Brandt's bat *(Myotis brandtii),* whiskered / Brandt's bat and noctule bat. This is consistent with the desk study returns and indicates a relatively low level of bat interest at the survey area.

Potential impacts and recommendations

- 4.4.11 In line with most solar PV developments, impacts from the Proposed Development are very likely to be minimal on the principal bat foraging and commuting habitats (hedges, watercourses, wetlands, scrub and woodland). Grassland where solar development will be focused mostly have less interest for bats and will in any case be retained in large part. In addition, there is a likelihood of grassland diversification along retained buffer as the design of the scheme emerges. As such, no detailed bat activity surveys are recommended at this stage. However, it is recommended that consultation with Natural England and the local planning authority is undertaken to agree this approach.
- 4.4.12 If any trees with bat roosting potential are likely to be affected by the Proposed Development then these would be surveyed to determine whether bats are roosting and likely to be affected. On the basis of no likely impact on buildings, no further survey for bat roosting in buildings is recommended.

4.5 Badgers

Results and Evaluation

- 4.5.1 The data search returned no records of badger Meles meles within the survey area. Five records were returned, the closest of which is from approximately 350m west.
- 4.5.2 No evidence of badger presence was recorded during the survey.Woodland habitats will provide both good potential sett creation opportunities (although no setts were recorded) and good foraging habitat.



Potential impacts and recommendations

4.5.3 Badgers are highly mobile and can change their use of an area (and their territories) in response to external pressures (such as territorial disputes or anthropogenic activities). Given the potential for parts of the survey area to become colonised by badger, checks for signs of badger activity on the survey area over the course of forthcoming survey visits is recommended.

4.6 Birds

Results and evaluation

Breeding birds

- 4.6.1 Records of rook (*Corvus frugilegus*), wheatear (*Oenanthe oenanthe*) and "sensitive species" were returned for the Survey area itself from the desk study. There are numerous records of birds in the area, including many for species potentially sensitive to solar farm development at the Survey area, such as mute swan (*Cygnus olor*), lapwing (*Vanellus vanellus*), curlew (*Numenius Arquata*), skylark (*Alauda arvensis*), and dipper (*Cinclus cinclus*).
- 4.6.2 The scrub and young woodland located within the survey area is suitable for breeding passerines. The grassland habitats are suitable for ground nesting species, although opportunities are likely confined to locally dominant soft rush tussocks as the grass itself is heavily grazed by sheep.
- 4.6.3 The wetland habitats around the ponds offer suitable nesting opportunities for wildfowl and certain passerine species such as reed bunting *(Emberiza schoeniculus)* and grasshopper warbler *(Locustella nivalis)*.

Wintering bird

4.6.4 The Solway Firth SPA is designated for a range of passage and wintering birds, some of which could make use of the survey area. It is therefore possible that the survey area is "functionally linked" to the SPA (meaning, broadly, that it provides supporting habitat that could be used by SPA-interest birds).



- 4.6.5 There are numerous records of birds in the area, including many for species potentially sensitive to solar farm development, such as greylag goose (*Answer answer*), pink-footed goose (*Answer brachyrhyncus*), mute swan (*Cygnus olor*), oystercatcher (*Haematopus ostralegus*), lapwing (*Vanellus vanellus*), herring gull (*Larus argentatus*), and curlew (*Numenius Arquata*).
- 4.6.6 Very few birds were recorded within the survey area during the wintering bird characterisation survey. Observations of note include a group of lapwings on the periphery, an overflying buzzard (*Buteo buteo*), raven (*Corvus corax*), pink-footed geese (*Anser brachyrhynchus*), and kestrel (*Falco tinnunculus*). Some small pockets of potential ornithological interest are present associated with hedgerow or woodland edges. However, the majority of the survey area is heavily sheep-grazed with a resulting close sward lacking habitat likely to be of high value to wintering birds.
- 4.6.7 Breeding and wintering bird surveys in 2011/12 commissioned by Airvolution Energy identified a range of breeding and wintering birds across their study area that was consistent with the recent wider desk study for the survey area. It was also noted in the Potato Pot ES Chapter 6 that the wind turbine Survey area is within a hen harrier sensitive location.

Potential impacts and recommendations

- 4.6.8 A requirement for a HRA in respect of the interest of the SPA is possible and further survey would be required to confirm the ornithological value of the survey area.
- 4.6.9 In addition, the scheme will give rise to more localised landscape changes and may alter its use by breeding birds (in particular, ground-nesting species) over a relatively large area.
- 4.6.10 Further survey for birds should include breeding bird surveys between March and July 2023 (underway at the time of writing). In addition, to inform the requirement for HRA wintering bird surveys during winter 2023/2024, with the scope agreed with Natural England.



- 4.6.11 It is recommended that up-to-date information on the location of hen harrier sensitive locations is secured and that consultation with RSPB and the local planning authority, as well as Natural England, is undertaken in respect of the scope of further bird survey.
- 4.6.12 Nearby barns (see below, potential roost assessment for bats) have potential to support nesting barn owl, but these are to be retained and the potential for significant adverse impacts on barn owl are limited to disturbance of potential nest sites depending on proximity to barns, timing of work and presence of nesting barn owl. Heavily grazed grasslands on the southern part of the Survey area have low potential to support barn owl prey species (land to on the northern part has higher potential). If unavoidable significant disturbance of barns is likely, then a check for evidence of nesting barn owl in nearby barns would be recommended.

4.7 Otter and water vole

- 4.7.1 Several minor watercourses flow through the southern half of the survey area and two otter spraints were recorded: one along Thief Gill and the other on the watercourse to the west of Thief Gill in the southern part of the survey area (see Target Note 4). The stream habitats provide potential foraging and commuting habitat for otter, although holt creation opportunities are limited given the open nature of the banks (tree and scrub cover is generally absent from the banks) and the degree to which livestock poaching has occurred along the banksides. Nonetheless, the potential for laying up areas cannot be ruled out.
- 4.7.2 There are two records of otter close to the survey area; one at the southern end of the survey area, close to the southern extent of the main watercourse (Thief Gill) and the other on the eastern boundary where the watercourse leaves the survey area. This and the spraints suggest that otters are commuting along at least one of the watercourses. 21 records of otter were returned in total from the desk study, the most recent of which is from 2008.



4.7.3 There were two records of water vole Arvicola amphibius from the desk study (both from a similar location, approximately 1.5km south-west of the Survey area. No signs of water vole were recorded during the survey but the watercourses have potential to support the species.

Potential impacts and recommendations

- 4.7.4 Development of the survey area has the potential to impact habitat used by commuting and foraging otter, and with the potential to support otter resting places. Potential impacts include damage or destruction to resting places that may be present, harm to otter, and disturbance resulting from increased noise and light.
- 4.7.5 The River Derwent and Bassenthwaite Lake SAC is designated in part for the presence of otter, with animals from the SAC making use of the survey area. It is therefore possible that the survey area is "functionally linked" to the SAC (meaning, broadly, that it provides supporting habitat that is used by SAC-interest species). A requirement for HRA in respect of otters and the interest of the SAC is therefore likely.
- 4.7.6 Further survey is recommended to assess the value / use of watercourse habitats to otter and confirm the presence / absence of resting places. This will inform the assessment of likelihood of an impact arising and the need for particular mitigation or design measures.
- 4.7.7 Water vole surveys of any affected watercourses or water bodies are also recommended to be completed alongside the otter surveys.

4.8 Reptiles

- 4.8.1 The desk study identified eight records of common lizard *(Zootoca vivipara)* (closest: 700m west and 700m south of the survey area); and seven of adder *(Vipera berus)* (one location, 1.7km south-west of the survey area).
- 4.8.2 The heavily grazed grassland habitats on the survey area have low suitability for reptiles, lacking the structural diversity to provide basking



and foraging opportunities. The coarser areas of grassland such as the areas around the existing turbines and woodland edges are suitable for common reptiles species such as common lizard and slow worm *(Anguis fragilis)*. Habitat in the surrounding area contains upland heath, further woodland habitat and a number of quarries, all of which will provide potential habitat for reptiles.

4.8.3 A single common lizard was recorded during survey in the north-east corner of the survey area. Common species of reptiles, such as slow worms and common lizards are likely to be present on Site, albeit in low numbers.

Potential impacts and recommendations

4.8.4 Loss of habitat that is suitable for reptiles is unlikely, and the risk of killing / injury of reptiles is very limited given the very open and short-sward nature of the grassland that is likely to form the development footprint. Further survey for reptiles is therefore not currently recommended, unless the design of the Proposed Development includes locations or activities that would be likely to affect potential reptile cover. Depending on the layout of the scheme it is likely that implementation of a precautionary reptile method statement to ensure no killing of injury of reptiles would be adequate.

4.9 Great crested newts

- 4.9.1 The desk study identified a single record of great crested newt *(Triturus cristatus)* from 1.15km north-west of the Survey area, and over 1.2km from Pond 1, from a pond in Lillyhall. Assuming the development footprint is limited to open grassland, the record would be 1.5km from developed land. No records of previous EPS (European Protected Species) licences or licence returns, or positive GCN pond survey results have been identified on the MAGIC website.
- 4.9.2 HSI scores for the ponds are presented in **Table 4.3** below. An HSI score of 0.79 was assigned to Pond 1 and 2 indicating they are of 'good'



suitability for supporting GCN while Ponds 3 and 4 were assigned scores of 0.84 and 0.65 indicating they are of 'excellent' and 'average' suitability respectively.

Habitat Index	Pond 1		Pond 2		Pond 3		Pond 4	
Map location	А	1.0 0	A	1.0 0	А	1.0 0	А	1.0 0
area (m²) =	5830	0.8 0	2100	0.8 0	545	1.0 0	150	0.2 5
Dessication rate	never	0.9 0	never	0.9 0	never	0.9 0	sometim es	0.5 0
Water quality	good	1.0 0	good	1.0 0	good	1.0 0	moderat e	0.6 7
Shade (% of margin shaded 1m from bank)	0	1.0 0	0	1.0 0	0	1.0 0	0	1.0 0
Waterfowl	minor	0.6 7	minor	0.6 7	minor	0.6 7	absent	1.0 0
Fish population	possib le	0.6 7	possib le	0.6 7	possib le	0.6 7	absent	1.0 0
Number of ponds within 1km	5	0.7 5	2	0.6 0	1	0.4 5	2	0.6 0
Terrestrial habitat	good	1.0 0	good	1.0 0	good	1.0 0	moderat e	0.6 7
Macrophyte cover (%)	10	0.4 1	20	0.5 1	80	1.0 0	10	0.4 1
HSI score =	0.79		0.79		0.84		0.65	
Pond suitability =	good		good		exceller	nt	average	

Table 4.3: Results of HSI Survey

- 4.9.3 Environmental DNA surveys, and a survey using traditional techniques (bottle trapping, torching and egg searching) identified no evidence of GCN. eDNA results for all ponds were negative.
- 4.9.4 Although the eDNA survey of Pond 1 was constrained, there is a lack of nearby records and the low sward grassland that is likely to make up the footprint of the Proposed Development has low potential for great crested



newts. The results of the surveys completed suggest that it is unlikely that GCN are present within the Site.

4.10 Dormice

4.10.1 Whilst hedgerows and woodland within, and adjacent to, the Site are suitable for dormice, the Site is on the edge of the natural range of this species in the UK and their presence is unlikely.

Potential impacts and recommendations

- 4.10.2 If dormice are present on the Site, the design of the Proposed Development will retain all suitable dormice habitat (woodland, scrub, and hedgerows), and the design is likely to provide additional habitats for this species in the unlikely event that they are present. Operational phase management of the habitats within the Site will also improve existing suitable habitats.
- 4.10.3 Therefore, likely significant effects from the Proposed Development on dormice are not anticipated and no further surveys are considered necessary at this time.

4.11 Brown hare

4.11.1 A single record was returned for the survey area, and eight records in total, mostly within 1.5km of the survey area.

Potential impacts and recommendations

- 4.11.2 The bulk of the survey area has limited cover for brown hare Lepus europaeus and the species is unlikely to be significantly affected by the proposed development. Depending on the layout of the Proposed Development, consideration should be given to a construction phase method statement to ensure no harm to the species if vegetation that could provide cover for the species is impacted.
- 4.11.3 Structural diversification of field margins (for instance by sowing with tussocky grasses) could provide more cover for brown hare.



4.12 Red squirrel

4.12.1 One record of red squirrel Sciurus vulgaris was returned from within the survey area, and there are several close by in wooded areas. The bulk of the records appear to be from around the local settlements (where they are more likely to be recorded).

Potential impacts and recommendations

4.12.2 There is limited woodland cover for the species within the Site, and woodland will be retained during construction. Consideration should be given to a construction phase method statement to ensure no harm to the species if woodland is impacted.

4.13 Water shrew

4.13.1 Two records of water shrew *(Neomys fodiens)* were returned from approximately 900m west of the survey area and approximately 2km south.

Potential impacts and recommendations

4.13.2 It is possible that the species is present on the survey area, but unless the watercourses / water bodies are impacted, the species is unlikely to be significantly affected.

4.14 Polecat

4.14.1 Two records of polecat Mustela putorius were returned, from similar locations approximately 1.8 km to the north of the survey area.

Potential impacts and recommendations

4.14.2 Presence of polecat cannot be discounted, but unless suitable habitats such as watercourses, ponds, hedges, or woodland are impacted, the species is unlikely to be significantly affected. Consideration should be given to a construction phase method statement to ensure no harm to the species if structural vegetation or watercourses are impacted.



4.15 Hedgehog

4.15.1 No records of hedgehog Erinaceus europaeus were returned from the survey area. The closest record is from 950m west, at Gilgarran.

Potential impacts and recommendations

4.15.2 If hedgehog are on the survey area they would likely be restricted to scrub, hedgerows and woodland cover. If there is no significant impact on these habitats then no significant effect on the species would be expected. Depending on the layout of the Proposed Development, consideration should be given to a construction phase method statement to ensure no harm to the species if structural vegetation is impacted.



5 Conclusion

- 5.1.1 Stantec UK Ltd was commissioned by FVS Dean Moor Limited to undertake a PEA at the Site for the Proposed Development. The purpose of the PEA is to provide preliminary baseline information about the likely / potential ecological interest of the Site, further survey recommendations, and early comment on potential constraints and opportunities associated with the potential ecological interest of the Site.
- 5.1.2 The Site is predominantly pasture that is grazed by cattle and sheep. It is generally drained by a series of unnamed minor watercourses which run broadly south to north and west to east in the southern part of the Site
- 5.1.3 A number of statutory designated sites are present near to the Site, including the River Derwent and Bassenthwaite Lake SAC/SSSI and Solway Firth SPA. Further surveys and assessment (including HRA) are recommended to fully understand potential effects to these receptors.
- 5.1.4 Dean Moor CWS is partially located within the Site. The layout of the Proposed Development should avoid direct impacts to Dean Moor CWS where possible. It is recommended that further botanical survey information is secured in respect of Dean Moor CWS, to fully assess the potential for effects on the interest features. The potential for the enhancement of the CWS through the implementation of appropriate management should be considered, and subject to agreement with stakeholders.
- 5.1.5 There is potential for direct impacts to notable habitats such as ancient woodland and hedgerows, and other habitats of ecological value such as plantation woodland, and ponds although these can be avoided by designing appropriate stand-off distances from development activities.



- 5.1.6 Presence of or potential for a number of notable species has been identified. Further surveys are recommended for:
 - Otter and water vole;
 - Breeding and wintering birds;
 - Habitats; and
 - Roosting bats (if required).
- 5.1.7 A range of measures to mitigate impacts and provide ecological enhancements are recommended.



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7 Figures

Figure 1: Statutory Designated Sites Plan

Figure 2: Non-statutory Designated Sites and notable habitats Plan

Figure 3: Habitat Plan







Path: Z:\Projects\332511471\332511471.aprx







Appendix A Target Notes

Target Note Number – Figure 3a	Description
1	Locally dominant soft rush in field (indicative position only)
2	Field in poor condition – fewer than 6 species per square metre (indicative position only)
3	Dominant soft rush (indicative position only)
4	High proportion of scattered scrub over semi-improved neutral grassland (hawthorn, willow sp.)
5	Locally dominant common nettle in ground layer of woodland, indicative of nutrient enrichment
6	High proportion of bare ground present in grassland
7	Target for more detailed botanical survey if necessary
8	Target for more detailed botanical survey if necessary
9	Rhododendron – Schedule 9 invasive species in woodland
10	Common lizard sighting in area of recently felled woodland dominated by brash. Wet underfoot
11	Barn owl (Schedule 1 bird) sighting – roosting in tree within woodland
12	Planted trees present in field, no older than saplings. Most have failed
Target Note Number – Figure 3b	Description
1	Spoil heap – potential to shelter reptiles and/or small mammals
2	Field in poor condition – fewer than 6 species per square metre therefore automatic poor condition for BNG purposes (indicative position only)
3	Locally dominant soft rush (indicative position only)
4	2 x otter spraints on prominent rocks within watercourse channels
5	Agricultural buildings – negligible bat roost potential but good suitability for barn owl
6	Disused quarry with exposed rock
7	Curlew sighting, not thought to be nesting but was not recorded on previous breeding bird surveys



Appendix B Photographs

Photograph 1: heavily grazed and poached grassland typical in northern part of Surveyed Photograph 2: heavily grazed and poached grassland typical in southern part of the Surveyed Area



Photograph 4: pond 1



Area

Photograph 3: woodland located around pond 1



Photograph 5: pond 2



Photograph 6: pond 3



