

**BILSHAM FARM SOLAR PARK
ECOLOGICAL APPRAISAL
for
BNRG RENEWABLES LTD & LANDLINK ESTATES
October 2013**



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EXECUTIVE SUMMARY

The Landmark Practice (TLP) was commissioned by BNRG Renewables Ltd and Landlink Estates in July 2013 to assess the potential ecological impacts associated with the development of a photovoltaic (PV) solar park at 36 ha of land at Bilsham Farm, off Drove Lane, Main Road, Yapton, West Sussex.

This ecological report identifies and assesses the value of ecological receptors within and directly adjacent to the application site and determines potential impacts arising from the proposed development. Where necessary, recommendations are made for measures to avoid impact and to provide mitigation/compensation and ecological enhancement. The table below summarises the key ecological issues arising from the proposed development, and the mitigation and enhancement strategies proposed.

Site Description & Development Proposals	
What surveys have been undertaken?	The site was subject to a desk study and an Extended Phase 1 habitat survey
Designated Sites	
Are any designated sites located within 1 km of the application site?	No
If yes, provide details:	N/A
Is the development likely to have an impact on these sites?	N/A
Habitats	
Phase I habitat types present <u>within</u> the application site	Arable land, semi-improved grassland, mixed woodland, tall ruderal vegetation, hedgerows, watercourse/ditches, existing building and an access track
Phase I habitat types located <u>adjacent</u> to the application site	Arable land, deciduous woodland, pond, watercourses/ditches, hedgerows, parkland and wood pasture
European Protected Species	
Does the site provide habitat for European Protected Species?	Yes
If yes, provide details:	Habitats may support bats, otter and great crested newt
Will the development have an impact on these species?	No, providing the mitigation strategy is implemented
UK Legally Protected Species	
Does the site provide habitat for other legally protected species?	Yes
If yes, provide details:	Site could provide foraging, commuting and sheltering habitat for badgers, water vole, birds, common reptiles and common amphibians
Will the development have an impact on these species?	No providing the mitigation strategy is implemented
Habitats/Species of Principle Importance & LBAP Habitats/Species	
Does the site contain Notable Habitats / Habitats of Principal Importance / LBAP Priority Habitats?	Yes
If yes, provide details:	Arable field margins and hedgerows
Does the site contain Notable Species / Species of Principal Importance/LBAP Priority Species?	Yes
If yes, provide details:	Potentially bats (certain species), brown hare, European hedgehog, otter, water vole, birds (certain species), reptiles, amphibians (potentially including great crested newts)

Will the development have an impact on these species?	No providing the mitigation strategy is implemented
Recommended Further Surveys	
Are further surveys recommended?	Yes
If yes, provide further details:	• Badger – pre-commencement checks for badger activity/setts; • Birds – pre-commencement checks for nesting birds;
Avoidance, Mitigation and Compensation	
Will impacts on ecological receptors be avoided?	Impacts will be avoided for other species in line with the mitigation proposals outlined below
Is mitigation/compensation proposed?	Yes
If yes, provide details:	• Protection of sensitive habitats through the creation of a habitat buffer of at least 8m; • Tree survey in line with BS5837:2012 to assess woodland area and to identify potential bat roosts; • No night time lighting/working to avoid impacts on light sensitive species; • A repeat badger and otter survey will be undertaken prior to commencement of development activities; • Trenches left open overnight will be graded or fitted with a rough sawn plank to allow escape; • Work will avoid the bird nesting season, or an experienced ecologist will undertake a check for nesting birds immediately prior to work commencing, if nesting birds are present work will need to be delayed until the chicks have fledged; • Habitat degradation/phased clearance to decrease suitability of habitat for reptiles; and • Panels should be installed in winter months to avoid potential impacts upon foraging/commuting reptiles and amphibians.
Ecological Enhancements	
Are ecological enhancements provided?	Yes
If yes, provide details:	• Filling in hedgerow gaps (using native fruiting and flowering species), increasing species diversity and structure and the proposed hedgerow, woodland and tree planting, will provide habitat enhancements for a range of wildlife; • Creation of 2100 m of new species-rich hedgerow (using native fruiting and flowering species and incorporating 1500 m of new tree planting), along application site boundaries; • Creation of a wildlife protection zone of at least 8 m around the perimeter of the construction zone/field boundaries; • Change of use from current arable cultivation and conversion to grassland will potentially increase the value of the application site to wildlife; • Cessation of the application of artificial fertilisers and pesticides will reduce nutrient enrichment of run-off and subsequent pollution of drainage ditches and adjacent watercourses and waterbodies. This will reduce eutrophication of aquatic habitats; • Creation of hibernacula near to existing waterbodies and within buffer zones will provide overwintering, basking and shelter habitat for reptiles, amphibians and other wildlife;

	• Installation of eight bat boxes on trees within the application site and boundary habitat to provide roosting enhancements for bats; and • A sensitive long-term management plan should be prepared and implemented to cover the management of the retained and enhanced habitats such as hedgerows, ditches, field margins and grassland.
What Species of Principle Importance & LBAP Species will this benefit?	Bats, brown hare, European hedgehog, otter, water vole, birds, reptiles and amphibians

Subject to the implementation of avoidance, mitigation, compensation and enhancement measures discussed in **Sections 7.0** and **8.0** of this report, this assessment concludes that the proposed development is capable of being accommodated without significant negative impacts on ecologically sensitive receptors within the survey area. The enhancement measures proposed are likely to result in a range of benefits to the ecology of the local area, particularly through implementation of a dedicated, sensitive and appropriate management regime of habitats and features within the application site boundary.

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1.0 INTRODUCTION

Scope of Report

- 1.1 The Landmark Practice (TLP) was commissioned by BNRG Renewables Ltd & Landlink Estates in July 2013 to undertake an Ecological Appraisal of land at Bilsham Farm, near Yapton, West Sussex. The purpose of this report is to inform a planning application for development of an approximately 14.5 MW PV solar park.
- 1.2 This report identifies and assesses the value of ecological receptors within and directly adjacent to the site and identifies the potential impacts arising from the proposed development. Where considered necessary, recommendations are made for further surveys and mitigation measures.

Site Location and Description

- 1.3 The application site currently comprises approximately 37 ha of arable land at Bilsham Farm, off Drove Lane, Main Road, Yapton (central grid reference SU 961024; **Figure 1** refers). The site is approximately 1.5 km south of Yapton and 2 km north east of Middleton-on-Sea. The application site is primarily used for agricultural activities including crop production and is surrounded by hedgerows, ditches and the watercourses of Ryebank and Lidsey Rife.

Development Proposals

- 1.4 The layout of the proposed development is shown on the submitted masterplan.
- 1.5 The solar park will be set out in rows of module tables, lined from the east to west and orientated to the south in order to capture maximum solar energy. Sufficient space will be allowed between the rows to avoid one row of PV modules overshadowing the next.
- 1.6 The PV modules will be mounted on metal frames on posts piled into the ground causing minimal impact on the ground surface and will be fully removable on decommissioning. The modules will be a maximum height of 2.85 m above ground, with the panels mounted in landscape format, set at an angle of approximately 30 degrees.
- 1.7 The application site will be protected with a deer proof fence of up to 2.4m. The application site will not be artificially lit. The security fencing will not be dug into the ground and will, therefore, provide badgers and other small mammals with continued access to the site.
- 1.8 All existing boundary hedgerows and associated features will be retained. The external security fence will be off-set internally from the perimeter hedgerows by at least 8 m.
- 1.9 Once the solar park is established, the system will require minimal on-going maintenance. Experience has shown that PV modules are cleaned to a considerable degree by rainfall, but will also be manually cleaned several times a year.

- 1.10 Activity at the solar park will be limited to periodic repair and/or maintenance. Grassland will be managed over the likely 30-year life of the installation by a sensitive ecological management plan.

Legal and Planning Context

Legal Context

- 1.11 A range of habitats and species that may actually or potentially be relevant to the application site are afforded legal protection under National and International Legislation (**Appendix I** refers).

Planning Context

National Planning Policy Framework (NPPF)

- 1.12 The NPPF advises that when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principals:
- *“if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - *proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted unless the benefits of the development clearly outweigh both the impacts that it is likely to have on the features of the site and any broader impacts on the national network of Sites of Special Scientific Interest;*
 - *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
 - *opportunities to incorporate biodiversity in and around developments should be encouraged; and*
 - *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss”.*

Local Planning Policy

- 1.13 The development plan which is material to the proposed development is the Arun District Local Plan 2003. The Local Plan was adopted in 2003 and covers the period up to 2011. Some of the policies within the Local Plan have now expired. Only those policies ‘Saved’ are now valid.
- 1.14 Arun District is currently developing their Draft Local Plan. As of May 2013 the Pre-Submission Local Plan for Public Consultation is undergoing some reassessment (In relation to the Strategic Housing Market Assessment (SHMA) and reconsideration of strategic sites). This new Local Plan will replace the Arun District Local Plan 2003 upon completion and adoption.
- 1.15 The following saved policies of the Arun District Local Plan 2003 are potentially material to consideration of the biodiversity implications of the current application scheme:

Local Plan 2003

Policy GEN21 – Renewable Energy

“Planning permission will be granted for development for renewable energy generation provided that:

- there is no significant harmful environmental effect on the quality of the natural and built environments;...”*

Policy GEN29 – Nature Conservation across the District

“Development will only be permitted on sites which contain semi-natural habitats, features of nature conservation interest, or within wildlife corridors, where these can be largely retained and sympathetically incorporated into the scheme. Legal agreements may be used to offset the loss of, or impact on, any nature conservation resource present on the site prior to development.”

Submission Local Plan 2013

Policy SP3 – Countryside

“To ensure better management of the rural-urban fringe in those areas where significant new development is proposed, early consideration will need to be given to landscape and biodiversity enhancement, woodland management, recreation provision and access routes.”

Policy DM21 – Renewable Energy

“The Council will support renewable energy development subject to the criteria in this Policy. Schemes will be expected to contribute to the social, economic and environmental development and overall regeneration of the District.

Within areas of protected or sensitive landscapes, areas or buildings, development should generally be small scale or community based. The Council will support proposals for appropriately located renewable energy development, and their ancillary development where they meet the following criteria:

- The proposal is located and designed to minimise adverse impacts to landscape, habitats, the historic environment and residential amenity including visual, noise and odour impacts;*
- The location and design of proposals will need to take account of the Council’s landscape assessment and landscape sensitivity studies (or successor documents) and proposals for large scale renewable energy projects will need to be supported by a zone of theoretical visibility and viewpoint assessment;*
- Proposals will need to demonstrate that there are no detrimental cumulative impacts on landscape character, biodiversity, key species or residential amenity;*
- Proposals located within or close to the boundaries of areas designated for their landscape, ecological, or historic interest should demonstrate that development will not impact upon the purposes of designation;*

- *Proposals will need to demonstrate the potential benefits of the development to the host communities and identify opportunities for environmental enhancement;*

Schemes falling within landscape or nature designations will be considered where there are no alternatives and where a considerable community benefit is demonstrated and considered to outweigh the landscape impact ..."

Policy SP25 – Natural Environment

"Arun District Council will encourage and promote the conservation and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 17.1-17.6 that are recognised for the species and habitats contained within them."

Policy DM31 – Designated Nature Sites

"It is the policy of the Council to maintain, protect and where possible enhance the conservation value of International, European, National and Local designated sites as listed in Tables 17.1 - 17.6. Development not directly connected with or necessary to the management of the designated site(s) and which is likely to have an adverse effect on the site(s), will generally not be permitted however such development may be permitted where any of the following can be demonstrated:

- *There is no alternative solution (which shall be adequately demonstrated by the developer) and*
- *There are reasons of public health or public safety or*
- *There are benefits of primary importance to the environment or*
- *There are imperative reasons of overriding public interest.*

Notwithstanding the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined. Where development is permitted, the use of conditions or planning obligations will be used in order to avoid and minimise harm to the site(s). In any event, any adverse impacts shall be minimised and mitigated or compensated in full as agreed with the Planning Authority ..."

Policy DM36 – Development and Biodiversity

"Development schemes shall, in the first instance, seek to achieve a net gain in biodiversity and protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement.

Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person. All developments shall have regard to Natural England's standing advice for protected species ..."

Planning Guidance

- 1.16 Guidance is provided by Natural England in Technical Information Note 101 'Solar parks: maximising environmental benefits', which states that: "...sites of lower existing biodiversity value may offer opportunities to deliver enhancement measures. These should be considered on a site by site basis and are likely to be most effective when they contribute to local biodiversity priorities identified through your local Biodiversity Action Plan." (Natural England, 2011).

2.0 METHODS

- 2.1 The methods employed for carrying out the ecological appraisal followed standard guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2013).

Desk Study

- 2.2 A request was made in July 2013 to the Sussex Biodiversity Records Centre (SBRC) for protected/notable species records and statutory and non-statutory designated sites within 1 km of the application site boundary.
- 2.3 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was accessed in July 2013 for records of statutory designated sites of biological interest.
- 2.4 A review of designated sites was undertaken within the wider area (up to 10 km) to identify the presence of any designated sites important for bat species. No sites designated specifically for bats were identified.
- 2.5 Section 41 of the Natural Environmental and Rural Communities (NERC) Act 2006 and the Sussex Biodiversity Strategy (LBAP) were consulted to inform the identification of priority habitats and species.

Field Survey

Extended Phase 1 Habitat Survey

- 2.6 An Extended Phase 1 Habitat survey (IEA, 1995) was conducted at the application site on 1 August 2013 by an ecologist from TLP¹.

¹ A graduate member of the Chartered Institute of Ecology and Environmental Management (CIEEM)

- 2.7 The Phase 1 Habitat survey method was developed by the Nature Conservancy Council to provide, relatively rapidly, a record of the semi-natural vegetation and wildlife habitat over large areas of the countryside. It is a classification based principally on vegetation, augmented by reference to topographical and substrate features. Habitats are mapped using standard colour codes, with further information provided by means of dominant species codes and descriptive target notes. Extended Phase 1, as described in the Institute of Environmental Assessment's (now the Institute of Environmental Management and Assessment) Guidelines for Baseline Ecological Assessment, involves the collection of further information on habitat features of particular value to different ecological groups such as plants, fungi, lichens, mosses and faunal groups. The Extended Phase 1 Habitat Survey forms the first stage of the ecological assessment of a site and is used to identify whether further, more detailed species surveys are required.
- 2.8 Plant species nomenclature follows Stace (2010) and bird species nomenclature follows the British Ornithologists' Union (BOU) English vernacular names in The British List: A Checklist of Birds of Britain (8th edition) (2013). Mammal names follow Harris and Yalden (2008).

Evaluation

- 2.9 **Appendix II** provides details of ecological valuation techniques. Habitats and species identified within the application site, or those which may be affected by the proposed development have been assigned preliminary ecological values on a scale between 'International' and 'Site value'².

Survey Constraints

- 2.10 A small pond was identified approximately 250 m to the east of the application site (refer to **Target Note 7**). While the pond is within the wider landholding, surveyors were unable to locate the pond in question to assessing using the Habitat Suitability Index (HSI) for amphibian species. Analysis of aerial photos indicates the potential that the pond is ephemeral or no longer present.

² The term 'site value' has been used rather than 'within zone of influence only' as recommended by CIEEM, 2006. These values are compatible in relation to the application site and 'site' is considered to offer more clarity in a report context.

3.0 SURVEY RESULTS

Desk Study

Designated Sites

- 3.1 The data search and information provided by SBRC established that the application site is not covered by any statutory or non-statutory designations. The desk study identified that there are no statutory or non-statutory designated sites within 1 km of the application site.

Species

- 3.2 A range of species records were returned by the data search as summarised in Table 1. These included protected species and priority species under S41 and Local BAP and restricted to those relevant to the site and within the last 10 years.

Table 1: Summary of SBRC Biological records for Bilsham Farm

Species group	Common name	Scientific name	Area of search	No. of records	Date of records
Mammals	Brown hare	<i>Lepus europaeus</i>	1 km	3	2003 – 2010
	European hedgehog	<i>Erinaceus europaeus</i>		5	2003 – 2009
	Water vole	<i>Arvicola terrestris</i>		2	2003
Reptiles	Grass snake	<i>Natrix natrix</i>		2	2008 & 2011
	Slow worm	<i>Anguis fragilis</i>		2	2007
Amphibians	Common frog	<i>Rana temporaria</i>		5	2007
	Great crested newt	<i>Triturus cristatus</i>		1	2002
	Smooth newt	<i>Lissotriton vulgaris</i>		4	2008
	Palmate newt	<i>Lissotriton helveticus</i>		7	2008
Birds	Barn owl	<i>Tyto alba</i>		14	2003 – 2010
	Swallow	<i>Hirundo rustica</i>		3	2008 – 2009
	Cetti's warbler	<i>Cetta cetti</i>		9	2004 – 2010
	Corn bunting	<i>Emberiza calandra</i>		5	2004 – 2010
	Curlew	<i>Numenius arquata</i>		1	2004
	Gadwall	<i>Anas strepera</i>		5	2004 – 2008
	Grey partridge	<i>Perdix perdix</i>		4	2006 – 2009
	Grey heron	<i>Ardea cinerea</i>		31	2003 – 2010
	Little egret	<i>Egretta garzetta</i>		20	2003 – 2010
	Lapwing	<i>Vanellus vanellus</i>		16	2003 – 2010
Flora	Cornflower	<i>Centaurea cyanus</i>		1	2003
	Divided sedge	<i>Carex divisa</i>		1	2009
	Spreading hedge-parsley	<i>Torilis arvensis</i>		2	2005
Bats	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	4 km	1	2006
	Brown-long eared	<i>Plecotus auritus</i>		5	2003 – 2009
	Natterer's bat	<i>Myotis nattereri</i>		No figures provided	2000 – 2010
	Noctule	<i>Nactalus noctula</i>		No figures provided	200 – 2010
	Serotine	<i>Eptesicus serotinus</i>		3	2003 - 2007
	Unidentified bat	<i>Chiroptera sp</i>		6	2005 – 2011
	Unidentified long-eared	<i>Plecotus sp.</i>		2	2004 & 2007
	Unidentified pipistrelle	<i>Pipistrellus sp</i>		9	2003 – 2010
	Whiskered bat	<i>Myotis mystacinus</i>		1	2004

Field Survey

Extended Phase 1 Habitat Survey

- 3.3 **Figure 2** shows the main habitat types found within the application site and the target note locations (**Appendix IV** refers). The application site comprises existing agricultural land and buildings (a stone barn). Main habitat types include arable land, semi-improved grassland, hedgerows, ditches and streams, woodland and tall ruderal vegetation. Site photographs are provided in (**Appendix III**).

Arable land

- 3.4 Two of the fields which comprise the application site are used for arable cultivation (refer to **Photograph 1**). Fields 1 and 2 appear to have been recently harvested and harrowed. Earlier in the season the fields were used to grow lettuces³. The western end of Field 1 was the only vegetated area (refer to **Photograph 4**). It was covered in a dense sward dominated by flax (*Linum usitatissimum*) and sweet vernal-grass (*Anthoxanthum odoratum*) with arable weeds, scarlet pimpernel (*Anagallis arvensis*) and field speedwell (*Veronica persica*) (refer to **Target Note 4**).
- 3.5 Both fields are surrounded by a 1 – 2 m field margin of relatively unmanaged vegetation (refer to **Photograph 3**). These areas include a mix of grass species and ruderal vegetation including Yorkshire fog (*Holcus lanatus*), false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), clustered dock (*Rumex conglomeratus*), common knapweed (*Centaurea nigra*), common nettle (*Urtica dioica*), creeping buttercup (*Ranunculus repens*), hogweed (*Heracleum sphondylium*), lesser burdock (*Arctium minus*), scentless mayweed (*Tripleurospermum inodorum*) and spear thistle (*Cirsium vulgare*).

Semi-improved grassland

- 3.6 Fields 3 and 4 have been classified as semi-improved grassland (refer to **Photograph 9**). Anecdotal evidence⁴ suggests that these two fields have previously been managed for arable crops. Regular flooding from the adjacent Ryebank and Lidley Rife watercourses limits its suitability as agricultural land. At the time of survey the fields were covered in a dense sward of tall grasses including Yorkshire fog, false oat-grass, cock's-foot, reed-sweet grass (*Glyceria maxima*), perennial rye-grass (*Lolium perenne*) and soft brome (*Bromus hordeaceus*). Herbaceous species include field bindweed (*Convolvulus arvensis*), meadow vetchling (*Lathyrus pratensis*), ragwort (*Senecio jacobaea*), spear thistle, tufted vetch (*Vicia cracca*) and wild teasel (*Dipsacus fullonum*).

Hedgerows and ditches

- 3.7 Field boundaries are frequently delineated by linear hedgerows (refer to **Photograph 3**). The hedgerows are typically 1.5 to 4 m tall and 1.5 – 3 m wide. Hedgerows throughout the application site are species-poor and primarily intact. There are gappy areas, predominantly along the northern boundary (refer to **Photograph 1**). Dominant species include blackthorn (*Prunus spinosa*) hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus* agg) with examples of field maple (*Acer*

³ TLP Staff: A. Hunter, P. Etheridge and O. Pike previously visited the site briefly with the developer. At the time, the arable crop included lettuces.

⁴ From conversation with local naturalist

campestre), ash (*Fraxinus excelsior*), hazel (*Corylus avellana*), English oak (*Quercus robur*) and elder (*Sambucus nigra*).

- 3.8 Fields are bounded by ditches and watercourses of varying size and depth (refer to **Photographs 5, 6 and 7**). These range from 0.5 – 3 m in depth and 0.5 to 4 m in width. The majority of ditches were holding water at the time of survey with the most substantial ditches, which delineate the application site on its southern, western and eastern boundaries functioning as drains/watercourses. Two of the ditches/watercourses which bound the application site are classified as main rivers. To the south is Ryebank Rife (refer to **Target Note 5**) and to the west is Lidsey Rife (refer to **Target Note 6**).
- 3.9 Species present include common reed (*Phragmites australis*), reed sweet-grass (*Glyceria maxima*), reed canary-grass (*Phalaris arundinacea*), bulrush (*Typha latifolia*), **broad-leaved pondweed** (*Potamogeton natans*), water plantain (*Alisma plantago-aquatica*), common duckweed (*Lemna minor*), fool's water-cress (*Apium nodiflorum*) and hemlock water-dropwort (*Oenanthe crocata*). A number of ditches were covered in dense mats of duckweed.

Semi-natural mixed woodland

- 3.10 A linear stand of mixed woodland is located centrally within the application site (refer to **Photograph 8**). The woodland was dominated by mature deciduous species with scattered mature conifers. Dominant species include oak, field maple, blackthorn, hawthorn, ash, grey willow (*Salix cinerea*) and Scots pine (*Pinus sylvestris*). The understory was limited to bramble and nettle. Isolated mature trees were scattered throughout the hedgerows of the application site.

Tall ruderal vegetation

- 3.11 Areas of tall ruderal vegetation are primarily concentrated around the existing agricultural building and along the access track. Species include bramble and nettle, lesser burdock, ragwort, hogweed, field bindweed and great willowherb (*Epilobium hirsutum*).

Access track

- 3.12 An access track (approximately 6 m wide), primarily bare ground with scattered building aggregate/gravel, bisected the application site roughly west to east. Scattered ruderal vegetation is present along the track and includes grass species including perennial rye-grass and annual meadow-grass (*Poa annua*), common nettle, bramble, thistles and oil-seed rape (*Brassica napus*).

Buildings

- 3.13 A stone barn and stone walled compound are located centrally within the application site (refer to **Target Note 1**). The barn is surrounded by ruderal vegetation dominated by bramble and common nettle. The building has potential access points on its northern and southern aspects and a poorly maintained roof. Tiles are missing allowing access along roof hips and eaves (refer to **Photograph 10**). The interior was dark and was used for storage. The building was accessed to look for obvious signs of roosting bats or birds. The interior was dark and open, with large roof timbers which could provide roosting crevices for a range of bat species. The building also offered potential roosting points for barn owls. Extensive evidence of owl pellets

(piles of undigested material including fur and bones) was identified within the barn. No intact pellets were identified. This could indicate that the building has not been actively used by owl species for some time.

Surrounding land

- 3.14 The site is surrounded by further agricultural land (arable and pasture), wood pasture and parkland to the south and a network of ditches and watercourses. A small woodland plantation is located to the west of the application site. This primarily comprises young trees with trunk diameters of approximately 100 to 200 mm. Ordnance Survey (OS) maps indicate a small pond directly adjacent to this woodland area (refer to **Target Note 7**). Such a waterbody is not apparent on aerial photographs. As discussed in paragraph 2.10, efforts to find the pond were made during the field survey; however due to dense vegetation, no body of water was identified. The pond could be seasonal or ephemeral in nature.

Species

Bats

- 3.15 The mature trees in the hedgerows and linear belts of woodland could provide potential habitat for tree roosting bats. The agricultural building also offers some potential; this includes both external and internal features which could support roosting bats. The hedgerows, ditches, associated field margins and semi-improved grassland are likely to support foraging and commuting activity.

Badger (*Meles meles*)

- 3.16 No evidence of badger activity was recorded within the application site during the field survey. Previous ecological work (Loughborough Ecologists, 2008) undertaken to inform the development of an adjacent reservoir, indicates the presence of a large badger sett with multiple entrances approximately 250 m to the east of the application site.

Hazel dormouse (*Muscardinus avellanarius*)

- 3.17 The application site includes a number of dense, established hedgerows with a good diversity of fruiting species. These could provide habitat for dormouse should they be present in the wider area. The nearest dormouse records are approximately 4.5 km to the north. Hedgerows within and which bound the application site are relatively fragmented and gappy, providing only tenuous links. The number and extent of ditches/watercourses could provide barriers to dispersal throughout the wider area.

Otter (*Lutra lutra*) and water vole (*Arvicola terrestris*)

- 3.18 The ditches/watercourses within and which bound the application site represent potential habitat for both otter and water vole, although no direct evidence was noted during the field survey. The dense, lush vegetation provides an abundant food source for water voles. Anecdotal evidence⁴ and biological records show the presence of water vole within 1 km of the application site. The dense vegetation which fringed the ditches may have obscured field signs. No records for otter were provided within the area of search, with nearest records within the wider area approximately 7 km to the northeast. Environment Agency data (EA, 2013) suggests that watercourses within the area are of moderate to good ecological quality.

Other mammals

- 3.19 During the field survey deer tracks were noted along the field margins, these are attributable to roe deer (*Capreolus capreolus*). A single adult brown hare (*Lepus europaeus*) was noted within Field 1.

Birds

- 3.20 A number of waterfowl were noted within the Ryebank Rife watercourse during the field survey. These included grey heron (*Ardea cinerea*), mute swan (*Cygnus olor*) and moorhen (*Gallinula chloropus*). The fields which comprise the majority of the application site may provide suitable habitat for breeding skylark (*Alauda arvensis*) and other ground nesting birds, though no evidence was observed during the site visit. The field boundary hedgerows provide suitable habitat for nesting farmland birds. Anecdotal evidence⁴ suggests the presence of lapwing (*Vanellus vanellus*), skylark and barn owl (*Tyto alba*). Biological records indicate the presence of a range of notable bird species which may utilise the application site (**Paragraph 3.2** refers). A barn owl box was attached to a mature within the woodland belt. Evidence of barn owls including pellets was identified within the existing building.

Reptiles and amphibians

- 3.21 The field margins, woodland, semi-improved grassland hedgerows and ditches may support foraging and basking reptiles. Biological records indicate the presence of a range of common reptile species including adder (*Vipera berus*), grass snake (*Natrix natrix*) and slow worm (*Anguis fragilis*).
- 3.22 The grassland, hedgerows, ditches and woodland may provide suitable foraging habitat for amphibian species. The woodland may provide suitable hibernating sites for amphibian species. One record for great crested newt (*Triturus cristatus*) was identified within 1 km of the application site. This record dates from 2002 and is approximately 1 km to the north of the application site. It is associated with the settlement of Yapton to the north.
- 3.23 A water storage reservoir had been constructed directly adjacent to the application site in 2008. A detailed herpetological survey was undertaken to inform the development. The pond (as discussed in **Paragraph 2.10**) and surrounding habitats were surveyed for reptile and amphibian species. A small population of grass snakes was identified in relation to the small pond. In addition a small population of smooth newts (*Lissotriton vulgaris*) and palmate newts (*Lissotriton helveticus*) were identified. No great crested newts were found.
- 3.24 Ditches within and adjacent to the application site have the potential to support amphibian species. The three which bound the site to the west, south and east are extensive watercourses and are likely permanently wet. At the time of survey they had good bankside vegetation cover, however the watercourses themselves were covered in a matt of duckweed. Waterfowl were noted, and it is likely that fish are present. The internal ditches which delineate the internal fields have more potential for amphibian species. Good aquatic vegetation was noted, however at the time of survey large sections of these ditches were dry or held very little water.

Invertebrates

- 3.25 During the field survey a number of species were observed including a range of damselflies (*Zygoptera* sp.), small blue (*Cupido minimus*) and peacock (*Inachis io*). The agricultural fields offer limited value to invertebrates due to the lack of flowering plants. The semi-improved grassland, woodland, hedgerows and ditches are likely to support breeding and sheltering (including overwintering) invertebrates.

4.0 DISCUSSION AND EVALUATION

Evaluation of Habitats

- 4.1 Habitats identified within the study area have been assigned ecological values on a scale between International value and 'site' value. Habitats including arable fields and the access track are considered to be of negligible ecological value and have not been considered further.

Semi-improved grassland

- 4.2 The semi-improved grassland which comprised a large proportion of the application site is of limited ecological value due to the relatively low diversity of herbaceous species. Due to the height and density of the sward, however, the habitat could provide important foraging and sheltering habitat for small mammal species, birds, reptiles, amphibians and invertebrates.

Ecological value: **Site**

Hedgerows and ditches

- 4.3 While hedgerows within and bounding the application site are primarily species-poor and are somewhat fragmented, they nonetheless offer some connectivity, foraging and sheltering habitats for a range of species including bats, badger, small mammals, birds, reptiles, amphibians and invertebrates.
- 4.4 The ditches/watercourses which cross and bound the application site represent good habitat for amphibious mammals including otter and water vole. The smaller internal ditches also represent potential habitat for amphibian species.
- 4.5 The ditches add structure and diversity to the application site and increase the range of habitats available. The banks of the ditches were generally densely vegetated providing suitable cover and foraging. The ditches form a single interconnected network providing links throughout the wider area.
- 4.6 The watercourses which bound the application site to the south and west are classified as main rivers, and as such are managed by the Environment Agency (EA). An 8 m wide strip along the northern bank of the Ryebank Rife (to the south) had been recently mown.

Ecological value: **Local**

Semi-natural mixed woodland

- 4.7 The linear belt of semi-natural mixed woodland offers good botanical diversity with a range of mature and semi-mature species. The woodland offers a variety of foraging, commuting, sheltering and hibernating opportunities to a range of species including bats, badgers, small mammals, birds, reptiles, amphibians and invertebrates.

Ecological value: **Site to Local**

Tall ruderal vegetation

- 4.8 There are several small areas of tall ruderal vegetation throughout the application site. These areas are relatively dense and are frequently found in association with existing buildings and the access track. Tall ruderal vegetation may offer some limited foraging and commuting habitat for a variety of species. As this habitat is small in area, it is however of limited ecological value in the context of the application site and the wider area.

Ecological value: **Site**

Buildings

- 4.9 The building offers potential roosting features to a range of bat species and barn owls (with evidence of barn owl use). The building is stone in construction with numerous access points in both the roof and small windows. The stone barn is to be retained under current development proposals.

Ecological value: **Further assessment required**

Surrounding land

- 4.10 Habitats immediately bounding the application site are likely to support a range of protected/notable wildlife as indicated by biological records. These include bats, badgers, brown hare, farmland birds, reptiles, amphibians and invertebrates. The small pond directly west of the application site has been shown to support a small population of common amphibian species including smooth and palmate newt (Barry Kemp Conservation, 2008). The report suggests that these species are isolated within the pond and its immediate surroundings due to the presence of a large steeply sided and relatively fast flowing ditch which surrounded it. The wider network of ditches and streams is likely to support populations of otter, water vole and potential amphibians.

Ecological value: **Site to Local**

Evaluation of Species***Bats***

- 4.11 The woodland, ditches, hedgerows and field margins offer suitable foraging and commuting habitat for bats. The arable fields and semi-improved grassland offer limited foraging opportunities for bat species due to lack of flowering species which is likely to limit invertebrate numbers. Foraging and commuting activity is likely to be restricted to the boundary features including woodland, ditches and hedgerows.

- 4.12 The woodland area, hedgerow trees and existing building offers potential roosting features for bat species. The building had suitable access points including small open windows and a damaged roof hip allowing ingress to the building interior. Initial inspection identified no obvious evidence of bats (droppings, staining, scoring) however this does not preclude its use.

Ecological value: **Further assessment required**

Badger

- 4.13 The badger sett discussed in **Paragraph 3.16** was identified as “extensive” within the Loughborough Ecologists report (2008). While the sett is approximately 250 m from the application site this is potentially within the wider territory of a badger clan. The cultivated fields, semi-improved grassland, woodland and hedgerows represent suitable foraging habitat for badgers including earthworms, fruits and nuts.

Ecological value: **Site to Local**

Hazel Dormouse

- 4.14 This species requires species-rich woodland, hedgerows and scrub to ensure a continuous source of food is available throughout the seasons (Bright and Morris, 1989). Dormice rarely range further than 70 m from their nests, so require this habitat diversity within a small area (English Nature, 2006). In view of such requirements, the lack of records and poor habitat connectivity, the application site was considered sub-optimal for dormice.

Ecological value: **Negligible**

Otter and Water vole

- 4.15 The ditches which surround the site are likely to offer suitable habitat for both otter and water vole. The lush vegetation provides suitable foraging and cover for water voles. The network of watercourse provides good connectivity features throughout the wider habitat. The potential for water vole is supported by biological records (within 1 km) and anecdotal evidence⁴. There is some limited potential for otter holts and couches adjacent to or within the application site. None were observed during the field survey; however this does not preclude their presence. As discussed in **paragraph 3.18** there are no biological records of otters

Ecological value: **Local**

Other mammals

- 4.16 The application site may be used by species including fox (*Vulpes vulpes*), rabbit (*Oryctolagus cuniculus*) and European hedgehog (*Erinaceus europaeus*) for foraging and shelter. A single brown hare (*Lepus europaeus*) was observed during the field survey. Brown hare could use the site as part of a mosaic of habitats within a wider home range.

Ecological value: **Site to Local**

Birds

- 4.17 The arable fields could offer good foraging and nesting opportunities to a range of farmland birds. Its suitability however is subject to management practices. The cultivation of lettuces is likely to provide limited foraging opportunities for bird species. Additionally it is unlikely to offer suitable nesting habitat due to the frequency of disturbance and lack of cover. The boundary habitats (hedgerows and ditches) and woodland area offers more suitable nesting, shelter and foraging habitat.
- 4.18 Records of Schedule 1 bird's, barn owl and Cetti's warbler (*Cetta cetti*) have been recorded within 1 km of the application site. The application site and the surrounding area provide suitable habitat for both species. Barn owl boxes and old pellets were identified within the application site. Barn owls utilise open country including farm land. Barn owls prey principally on small vertebrates for which the boundary features and semi-improved grassland provide suitable habitat. Cetti's warbler prefers damp areas including reedbeds, swamp and dense vegetation within proximity to water. They prey on small invertebrates, of which are common around the ditches which surround the application site.

Ecological value: **Local to District**

Reptiles and amphibians

- 4.19 Arable land provides sub-optimal habitat for reptile and amphibian species. This is the result of a number of factors including regular disturbance, lack of suitable shelter/cover, treatment with pesticides limits foraging potential and farming practices (including ploughing, harrowing etc) can inhibit dispersal. Arable fields can provide some potential at certain times of the year, for example before harvesting (when the crop has progressed). The hedgerows, ditches, woodland and semi-improved grassland offer more suitable habitat for foraging, sheltering, commuting and hibernating.
- 4.20 Biological records indicate the presence of common reptile species within 1 km of the application site. It is likely that these species are mainly associated with the boundary habitats (hedgerows and ditches), woodland area and semi-improved grassland. A single record of great crested newt has been identified within 1 km of the application site.
- 4.21 The biological record for great crested newt is located to the north in Yapton. This record lies at the edge of the 1 km area of search. While great crested newts have been known to disperse to these distances, 250 m is considered to be more realistic area for the dispersion for most adults around a breeding pond (Langton, Beckett and Foster, 2001). As discussed in **Paragraph 3.22** a nearby pond was surveyed in 2008 for great crested newts. While other amphibian species were recorded, no great crested newts were identified.
- 4.22 Ditches and watercourses within and adjacent to the application site have the potential to support amphibian populations including great crested newts. There are two small ponds within 250 m of the application site. The first is approximately 250 m to the east of the application site (as discussed in **Paragraph 3.23**) has recorded populations of smooth newt and palmate newt. The second is approximately 250 m south of the application site across Ryebank Rife. All ditches and watercourses within and adjacent to the application site offer some potential for amphibian species. The

main watercourses which bound the application site are less suitable as a result of their size (permanent), presence of predatory species (waterfowl and likely presence of fish) and the dense duckweed, limiting aquatic vegetation. The smaller drainage ditches within the application site are likely to offer increased suitability. These ditches have a more ephemeral nature limiting predatory species (this could also limit suitability for breeding) and increased diversity of aquatic vegetation. The large watercourse could form barriers to dispersal, isolating potential populations or preventing/limiting potential access to the features of the application site.

Ecological value: **Site to Local**

Invertebrates

- 4.23 Arable fields offer limited habitat potential to invertebrates due to a lack of structure, limited flowering plants and treatment with pesticides. The hedgerows, ditches and semi-improved grassland offer more potential for breeding, foraging and sheltering invertebrates, however this is likely to be restricted due to limited species diversity.

Ecological value: **Site**

Summary Table

- 4.24 **Table 2** below provides a summary of the ecological values given to habitats and species actually or potentially relating to the application site.

Table 2: Summary of ecological evaluation

Habitat/Species	Ecological value
Semi-improved grassland	Site
Hedgerows and ditches	Site to Local
Semi-natural mixed woodland	Site to Local
Ruderal vegetation	Site
Buildings	Local
Surrounding land	Site to Local
Bats	Local
Badger	Site to Local
Hazel dormouse	Negligible
Otter and water vole	Local
Other mammals	Site to Local
Birds	Local to District
Reptiles and amphibians	Site to Local
Invertebrates	Site

Overall Evaluation

- 4.25 The application site is moderate in size and not particularly diverse in terms of habitat types present. The arable land and semi-improved grassland which comprises the majority of the application site is of low ecological value. The quality of certain habitats present, including the hedgerows and ditches, woodland, and the existing building increase the site value and offers opportunities to wildlife.
- 4.26 In view of the habitats and wildlife actually or potentially present, in its current condition the application site is considered to be '**Site**' to '**Local**' value.

5.0 LEGAL AND BAP CONSIDERATIONS

5.1 The application site is not subject to any statutory or non-statutory nature conservation designations. The following legally protected species have been identified as occurring or potentially occurring (to varying degrees), within or directly adjacent to the application site:

- Bats;
- Badger;
- Otter;
- Water vole;
- Breeding birds (including barn owl and potentially Cetti's warbler);
- Reptiles (adder, grass snake and slow worm); and
- Great crested newt.

5.2 These species are afforded protection under either European and/or domestic legislation including the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act, 1981 (as amended).

5.3 **Table 3** below details the habitats and species relevant or potentially relevant to the application site that are listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act (HMSO, 2006) as being of principle importance for the conservation of biodiversity in England and/or listed as priority habitats/species under local BAPs.

5.4 Under the NERC Act 2006, the Government has a duty to take reasonably practicable steps to further the conservation of the living organisms and habitats that are included in lists published under Section 41. It is also the responsibility of the Local Planning Authority to regard Section 41 species as material consideration in planning proposals.

Table3: Section 41 of the NERC Act 2006, and LBAP priority habitats and species actually or potentially relating to the application site

Habitats/Species	S41	LBAP
Arable field margins	✓	
Hedgerows	✓	
Bats (pipistrelle, noctule, long-eared)	✓	✓
Brown hare	✓	✓
European hedgehog	✓	✓
Otter	✓	✓
Water vole	✓	✓
Birds (certain species)	✓	✓
Reptiles	✓	✓
Great crested newt	✓	✓
Common amphibians	✓	✓

5.5 In order to address legal and planning requirements, the above species are further considered below in addition to the ecologically valuable species identified in **Section 4.0**.

6.0 CONSIDERATION OF IMPACTS

- 6.1 Assessment of the likely impacts (both beneficial and adverse) of the proposed development on habitats and wildlife species (ecological receptors) are described. Measures are recommended in **Section 7.0** below, in accordance with national and local planning policy and wildlife legislation, to avoid and (where necessary) mitigate or compensate negative impacts.

Habitats

- 6.2 The application scheme has been designed to avoid the majority of potential ecological impacts by confining the development to the interior of the site. The important features of the application site (the hedgerows, ditches and woodland) will be protected from impacts by the creation and safeguarding of a wildlife and landscape buffer. This buffer will be up to 8 m in width. Buffer areas will protect trees and hedgerows from root damage during construction.
- 6.3 To prevent shading of the solar panels, the boundary hedgerows will be cut annually to maintain a suitable height. Hedgerows throughout the site are in varying conditions as described in **Paragraph 3.7**. Sensitive management will potentially prolong their functional life by encouraging re-growth. This will increase habitat structure, density, improve connectivity and increase species diversity. Native flowering and fruiting species appropriate to the locality and site conditions will be used. All access to the site will use existing access roads and field entrances (via Drove Lane), thereby also avoiding any loss of hedgerow/ditch habitat.
- 6.4 For the lifetime of the proposed solar park, the fields will be taken out of their normal cycle of arable production and converted to permanent grassland managed by grazing/cutting.

Species

Bats

- 6.5 The existing building which possesses potential roost features will be retained and surrounded by an approximately 9000 m² buffer area. The building lies 28 m from the nearest point of works (installation of the security fence) and will not, therefore, be affected by the proposed development proposals. The woodland area and hedgerows will be retained and protected with the proposed buffer. As such no potential roosting sites and foraging/commuting habitat will be affected by development proposals.
- 6.6 Construction of the solar park may result in disturbance effects from noise during installation of the panels and supporting infrastructure. This could impact roost sites if present within proximity and affect commuting and foraging species.

Badger

- 6.7 The nearest badger sett is approximately 350 m to the east of the application site, therefore the proposed development is unlikely to result in direct impacts. Badgers using the site for commuting or foraging could fall into open trenches (via construction), resulting in injury or death.

Hazel dormouse

- 6.8 As discussed in **Paragraph 4.14**, dormice are unlikely to be present within the application site.

Otter and water vole

- 6.9 Otters and water vole are unlikely to be adversely affected by the proposed development. The incorporation of a buffer around ditches and watercourses as discussed in **Paragraph 6.2** will protect their habitats and prevent any adverse impacts from development.

Birds

- 6.10 The change from arable to grassland could result could result in improvements to nesting and foraging habitat within the field areas. Construction activities may present short-term disturbance effects.

Reptiles and amphibians

- 6.11 Boundary features (hedgerows and ditches) and woodland will be retained and will therefore minimise impacts to features important to amphibian species. Arable fields represent sub-optimal habitat for reptiles and amphibians species. The conversion of arable fields to grassland could provide more suitable foraging and commuting habitat. The change in use from arable and related activities to grassland will result in the cessation of inputs of artificial fertilisers. This will result in a decrease in nutrient runoff and the resulting eutrophication of adjacent ditches and watercourses (which delineate the application site). Over time and in conjunction with sensitive management, the condition of these features is likely to improve and, as a result, improve conditions for amphibians and other aquatic species.
- 6.12 Construction activities have the potential to result in impacts upon great crested newts (if present). While arable fields represent sub-optimal habitat, this does not preclude its use. Great crested newts could potentially be commuting across the site to access features (including hedgerows, ditches and woodland) within the site or in the wider landscape. As a result of this, installation of panels could result in killing/injury of a protected species.

Other species

- 6.13 The application site represents potential foraging habitat for brown hare. Hares utilise a mosaic of habitat types within a wider territory. The installation of panels will result in some loss of foraging habitat (semi-improved grassland and arable). The site may be used by European hedgehog for foraging, commuting and shelter. Hedgehogs use woodland and grassland habitats, favouring boundary and edge areas. As in the case of brown hare there is likely to be some loss of foraging habitat during installation of panels.

Summary of Potential Impacts

- 6.14 **Table 4** below provides a summary of the potential impacts on ecological receptors (in the absence of mitigation) as a result of the development proposals.

Table 4: Summary of potential impacts on ecological receptors

Site preparation and construction phase	Ecological receptor (<i>positive impacts are highlighted in italics</i>)
Creation of buffer habitat and screening planting to mitigate against landscape and visual impacts	<i>Hedgerows and ditches, bats, badger, otter, water vole, birds, reptiles, amphibians and invertebrates</i>
Short-term disturbance during delivery and installation of equipment	Potentially bats, badger and breeding birds
Night-time lighting/working	Light sensitive species including bats, badgers and potentially birds
Digging of trenches for installation of electrical cabling	Badger, small mammals, reptiles and potentially amphibians
Loss of low quality foraging habitats	Bats, badger, birds, small mammals, reptiles, amphibians and invertebrates
Operational phase	Ecological receptor (<i>positive impacts are highlighted in italics</i>)
Conversion of arable fields to grassland and reduction/cessation of artificial fertiliser use (reduce/prevent run-off into waterbodies and resulting eutrophication)	<i>Bats, badger otter, water vole, small mammals, birds, reptiles, amphibians and invertebrates</i>

7.0 RECOMMENDATIONS

- 7.1 The following recommendations for avoidance, mitigation and compensation measures for the application site are in accordance with guidance laid out in the NPPF, which sets out the policies on the protection of biodiversity through the planning system. This requires that, in determining a planning application, a Local Planning Authority should secure measures to firstly avoid, then mitigate or compensate for ecological harm, and also seek ways to enhance and restore biodiversity.
- 7.2 The measures discussed below address the requirements for avoidance, mitigation and compensation for development activities within the application site. Where full detail of installation activities is not known a precautionary approach has been adopted and appropriate measures recommended.
- 7.3 Works required outside the site boundary to connect the development to the grid will be undertaken in accordance with the permitted development rights of the electricity Distribution Network Operator (DNO) and in accordance with its duties under Schedule 9, sub-section (1) of the Electricity Act 1989⁵

⁵ (1) In formulating any relevant proposals, a license holder or a person authorised by exemption to generate, transmit, distribute or supply electricity –

(a) shall have regard to desirability of preserving natural beauty, of conserving flora, fauna a geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and

(b) shall do what he reasonably can do to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.

Avoidance, Mitigation and Compensation Measures

Sensitive habitats

- 7.4 All sensitive habitats within the application site (i.e. the hedgerows, ditches, trees) will be retained and protected. This will be achieved using permanent, robust security fencing during the construction and operational phases of development. The conversion of arable land to PV is unlikely to negatively impact adjacent habitats and species.
- 7.5 The creation of a wildlife protection zone of at least 8 m along all field boundaries will help to protect important features from accidental impacts, including root damage. Tree root protection zones will be identified and protective fencing installed where required to BS5837:2012.
- 7.6 Since the application site is surrounded by ditches and watercourses including the Ryebank Rife, it is important that pollution control measures are implemented during construction to ensure that there is no diffuse pollution from the site into the wider landscape.

Bats

- 7.7 All potential foraging and commuting habitat including the boundary features and belt of woodland should be retained and the habitat enhanced by landscape planting using native species. The only existing building on site is to be retained under current development proposals and is at some distance from any works.
- 7.8 If trees need to be removed, then they should be assessed for roost potential and be inspected for signs of roosting bats. Trees without roosting potential can be removed in accordance with BS5837:2012. Any trees within the application site that support roosting bats should be retained where possible.

Badger

- 7.9 Due to the ability of badgers to create new setts in a relatively short period of time, the presence of potentially suitable habitat within the application site and records of badger within 1 km, it is recommended that a repeat survey is undertaken one month prior to the commencement of construction. This will determine whether any new setts are present within the application site that would be directly affected by construction activities. If any badger setts are found, they should be monitored by an ecologist. This will assist in determining whether a licence issued by Natural England would be required to permit the works, subject to appropriate mitigation to prevent any breach of legislation protecting badgers and their setts.
- 7.10 During the construction phase, any trenches created within the application site will be left with graded (inclined) ends or a rough sawn plank to allow escape. The conversion of the fields from arable to grassland, especially if grazed, may benefit badgers by providing higher quality foraging habitat.

Otter and water vole

- 7.11 Otters and water vole are unlikely to be impacted by the proposed development, therefore no mitigation is required. A pre-commencement check should be undertaken for signs of otter activity including spraints, couches and holts.

Birds

- 7.12 To minimise disturbance to bird species (potentially including barn owl and Cetti's warbler), any vegetation clearance including future management of habitats (hedgerows, ditches, woodland and buildings) should be undertaken outside of the breeding bird season (usually March to August inclusive but seasonally variable). If works are proposed within the breeding bird season, a pre-commencement check for suitable nesting bird sites (hedgerows, woodland, buildings, barn owl boxes) or any activity within the application site should be undertaken by a qualified ecologist. Any active nests will need to remain undisturbed until it is confirmed that the young birds have fledged and the nest is no longer in use. The buffer zone along important features (hedgerows, ditches, woodland and building) should minimise disturbance effects upon nesting birds, however if nesting birds are present within the buffer habitats then ongoing monitoring would be required to ensure that impacts are avoided.

Reptiles and amphibians

- 7.13 The presence of common reptile and amphibian species cannot be ruled out, due to their presence within the wider area. The arable fields offer sub-optimal habitat for reptiles and amphibians, however the boundary features (ditches and hedgerows), woodland and semi-improved grassland provide suitable commuting, foraging and shelter/hibernating opportunities.
- 7.14 Subject to management practices, the use of habitat degradation measures should be undertaken. This approach will reduce the suitability of semi-improved grassland for reptile species. It should be noted that this technique is not suitable if important amphibian species (great crested newt) are present. To ensure that great crested newts (if present) are not adversely affected by development, installation of panels should be undertaken in winter when amphibian species are hibernating.
- 7.15 The habitat buffer around boundary features and the woodland area will minimise adverse effects upon reptile and amphibian species which utilise these features.

Other species

- 7.16 The creation of a habitat buffer around important features including hedgerows, ditches and woodland will avoid impacts on species groups such as reptiles, amphibians and invertebrates. No impacts are predicted on brown hare and hedgehog, therefore no mitigation is required.

8.0 ECOLOGICAL ENHANCEMENT

- 8.1 The following recommendations for ecological enhancement of the application site are in accordance with planning policy, whereby a key principle is a requirement for the local planning authority, in determining planning applications, to seek ways to enhance and restore biodiversity.
- 8.2 The following ecological enhancements are recommended within the application site:
- Filling in hedgerow gaps (using native fruiting and flowering species), increasing species diversity and structure and the proposed hedgerow, woodland and tree planting, will provide habitat enhancements for a range of wildlife including bats, dormice (if present), badger, birds, other small mammals, reptiles/amphibians (if present) and invertebrates;
 - Creation of 2100 m of new species-rich hedgerow (using native fruiting and flowering species and incorporating 1500 m of new tree planting), along application site boundaries;
 - Creation of a wildlife protection zone of at least 8 m around the perimeter of the construction zone/field boundaries. This will be managed to create rough species-rich grassland habitat, which will provide enhancements for species including foraging bats, badger otter and water vole, birds, basking/sheltering/foraging reptiles and amphibians and invertebrates;
 - Change of use from current arable cultivation and conversion to grassland will potentially increase the value of the application site to wildlife including bats, badger, otter, water vole, birds, other small mammals, reptiles, amphibians and invertebrates;
 - The cessation of the application of artificial fertilisers and pesticides will reduce run-off and subsequent pollution of drainage ditches and adjacent watercourses and waterbodies. This will reduce eutrophication of aquatic habitats and in, conjunction with sensitive management, will improve biodiversity of habitats and suitability for wildlife including otter, water vole, amphibians, reptiles and invertebrates (and consequently foraging for bats and birds);
 - The creation of hibernacula near to existing waterbodies and within buffer zones will provide overwintering, basking and shelter habitat for reptiles, amphibians and other wildlife;
 - The installation of eight bat boxes on trees within the application site and boundary habitat to provide roosting enhancements for bats;
 - A sensitive long-term management plan should be prepared and implemented to cover the management of the retained and enhanced habitats such as hedgerows, ditches, field margins and grassland.

9.0 CONCLUSION

- 9.1 Should development work be undertaken during the breeding bird season (paragraph 7.12 refers) further assessment/survey would be required prior to works commencing to satisfactorily conclude that the proposed development is capable of being accommodated without significant negative impacts on ecologically sensitive receptors within the survey area.
- 9.2 The enhancement measures proposed are likely to result in a range of benefits to the ecology of the local area.

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FIGURES



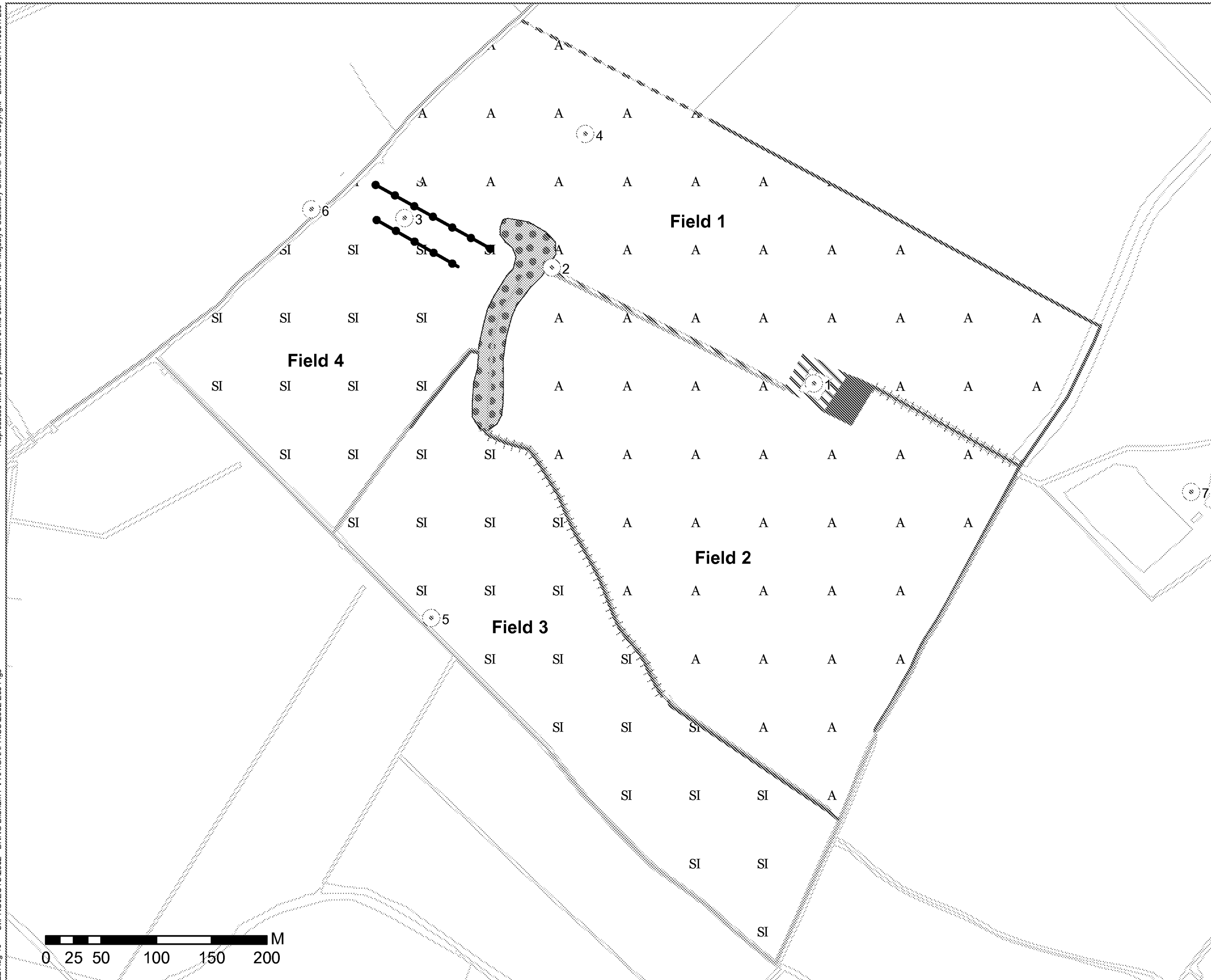
Site location

BILSHAM
SOLAR PARK

FIGURE 1
Site location

THE
Landmark
PRACTICE

Hope Chapel House Hope Chapel Hill
Hotwells Bristol BS8 4ND
Tel: 0117 923 0455 Fax: 0117 9253702
www.thelandmarkpractice.com



- Earth bank
- Defunct species-poor hedgerow
- Species-poor hedgerow with trees
- Intact species-poor hedgerow
- Running water
- SI Poor semi-improved grassland
- A Arable
- I Improved grassland
- Tall ruderal
- Broadleaved semi-natural woodland
- Mixed semi-natural woodland
- Target note

BILSHAM
SOLAR PARK

FIGURE 2
Extended Phase 1 Habitat survey



Hope Chapel House Hope Chapel Hill
Hotwells Bristol BS8 4ND
Tel: 0117 923 0455 Fax: 0117 9253702
www.thelandmarkpractice.com

APPENDIX I

LEGAL CONTEXT

APPENDIX I: LEGAL FRAMEWORK

1.0 PROTECTED SITES (EUROPEAN)

1.1 *Special Areas of Conservation (SACs)*

SACs are designated under **The Conservation of Habitats and Species Regulations 2010** ('2010 Regulations') (as amended) which implements **The European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC** (the 'Habitats Directive', EEC, 1992). Lists of candidate SACs (cSACs) have been submitted to the European Commission for approval. Both possible SACs (pSACs) and cSACs are treated by the planning system as if fully designated.

The Habitats Directive also refers to the need for nature conservation outside protected areas (Article 10) and measures to implement this article are incorporated in British legislation through the Habitats Regulations (HMSO, 1994) and ODPM Circular 06/2005 that accompanies PPS9. Article 10 of The EU Habitats Directive 1992 states that:

'Member States shall endeavour, where they consider it necessary, in their land use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild flora and fauna.'

Article 10 of The EU Habitats Directive 1992 (and Regulation 39(3) of the Conservation (Natural Habitats, & c. Regulations) 2010 goes on to state:

"The features of the landscape referred to in paragraphs (1) and (2) are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems of marking field boundaries) or their function as "stepping stones" (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species." 39(3)

1.2 *Special Protection Areas (SPAs)*

SPAs are classified in accordance with the **European Community Directive on the Conservation of Wild Birds (79/409/EEC)** (the 'Birds Directive', EEC, 1979). Under this Directive, the UK Government must also take special measures to conserve the habitat of species listed in Annex I of the Directive and all migratory species. The provisions of the Birds Directive are implemented in England through the Wildlife and Countryside Act 1981 (as amended) and the Habitats Regulations (2010).

1.3 *Ramsar sites*

The Ramsar Convention (UNESCO, 1987) requires signatory states to protect wetlands that are of international importance, particularly as waterfowl habitats.

2.0 PROTECTED SITES (NATIONAL)

2.1 *Sites of Special Scientific Interest (SSSIs)*

The **Wildlife and Countryside Act 1981** (as amended 1991 and varied 1998) (HMSO, 1981, 1991, 1998) requires Natural England, the Government body with authority for nature conservation in England, to designate areas which make a significant contribution to a national network of sites of nature conservation value as SSSIs.

The **Countryside and Rights of Way Act 2000** (HMSO, 2000) came into force in full on 30 January 2001. The Act is in five parts. Part III relates to Nature Conservation and amends existing legislation (i.e. the Wildlife and Countryside Act 1981) through improved protection and management of SSSIs, improved legal protection for threatened species and the provision of a statutory basis for biodiversity conservation.

2.2 *Local Nature Reserves*

Local Nature Reserves are designated under Section 21 of **The National Parks and Access to the Countryside Act 1949** (HMSO, 1949) by principal local authorities. The declaring local authority must have a legal interest in the land concerned. Local Nature reserves are designated for people and wildlife. They are places with wildlife or geological features of special interest locally and that give people special opportunities to study and learn about them or simply enjoy them and have contact with nature.

3.0 NON-STATUTORY SITES

The majority of Local Authorities have a system of 'second tier' sites which do not wholly fulfil SSSI designation criteria, but which are, nonetheless, of local or regional value. The policies, encouraged by Government advice, recognise that protection should be extended beyond the statutory sites to include the best examples of wildlife habitats, populations of rare species and geological features remaining in the area and are particularly valuable in supplementing and supporting the national framework for SSSIs.

4.0 PROTECTED FEATURES

4.1 *Hedgerow Regulations*

The **Hedgerow Regulations 1997** (HMSO, 1997) were introduced to protect 'important' hedgerows in the countryside by controlling their removal through a system of notification. The Regulations apply to lengths of hedgerow greater than 20m in length, not adjoining residential curtilages. 'Important' hedgerows are defined within the Regulations on a variety of historical and/or ecological criteria.

4.2 *Tree Preservation Orders (TPOs)*

TPOs are made under the Town and Country Planning (Tree Preservation) (England) Regulations 2012. They are made by local planning authorities to protect selected trees and woodlands if their removal would have a significant impact on the local environment and its enjoyment by the public. The criteria do not incorporate any specific considerations of ecological value. TPOs, however, provide legal protection

to trees prohibiting the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction.

5.0 PROTECTED SPECIES (EUROPEAN)

5.1 *Plants*

Certain plant species are listed under Annex IVb of the Habitats Directive under which it is an offence to deliberately pick, collect, cut, uproot or destroy such a plant.

Under the Bern Convention 1979, Contracting Parties are required to take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild flora species specified in Appendix 1. In the UK this is implemented through various national wildlife protection policies.

5.2 *Bats*

All British bats and their roosts are fully protected under international wildlife law against adverse effects including disturbance. Under the terms of the Bonn Convention, which encompasses the Agreement of the Conservation of Bats in Europe, there is a fundamental obligation to protect from damage or disturbance, sites which are important for the conservation status of bats. Such sites include those bats use for shelter or protection and important foraging areas.

5.3 *Dormouse (*Muscardinus avellanarius*)*

The dormouse is protected under Schedule 2 of the Habitats Regulations 2010 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Taken together, the Regulations and Act make it illegal to intentionally or deliberately kill, injure or capture dormice; deliberately disturb dormice and damage or destroy dormouse breeding sites or resting places.

5.4 *Otter (*Lutra lutra*)*

The otter is protected under Schedule 2 of the Habitats Regulations 2010 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Taken together, the Regulations and Act make it illegal to intentionally or deliberately kill, injure or capture otters; deliberately disturb otters and damage or destroy otter breeding sites or resting places.

5.5 *Birds*

In Britain all wild birds are granted legal protection under the EC Birds Directive and the Wildlife & Countryside Act 1981 (as amended). This legislation protects the birds, their eggs and nests whilst being built or in use.

Legal protection makes it an offence to intentionally kill, injure, take or have in possession any wild bird or egg. It is also an offence to intentionally damage or destroy the nest of any wild bird whilst it is being built or in use.

Under the Bern Convention 1979, Contracting Parties are required to take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. In the UK this is implemented through various national wildlife protection policies.

5.6 Great crested newt

The great crested newt (*Triturus cristatus*) is fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. The legislation protects the newts and their places of shelter or protection, which may extend 500m from the breeding pond.

5.7 Inverts

Under the Conservation of Habitats and Species Regulations 2010, invertebrate species listed on Schedule 2 it is an offence to deliberately capture or kill, disturb, take or destroy eggs of such a species or to damage or destroy the breeding site or resting place of such an animal.

6.0 PROTECTED SPECIES (NATIONAL)

6.1 Plants

Statutory protection in Great Britain is provided by the Wildlife and Countryside Act 1981. The plants and fungi which have special protection are listed on Schedule 8 under which it is an offence to intentionally pick, uproot or destroy any plant on Schedule 8.

Five plant species are listed on the Weeds Act 1959 as injurious: common ragwort (*Senecio jacobaea*), broad-leaved dock (*Rumex obtusifolius*), curled dock (*Rumex crispus*), creeping thistle (*Cirsium arvense*) and spear thistle (*Cirsium vulgare*). The Act requires landowners to eliminate scheduled weeds to prevent their seeds contaminating neighbouring land. The Ragwort Control Act 2003 amends the Weed Act with respect to common ragwort.

Thirty-eight species plus all species of *Elodea* (of which there are currently three species known to have been introduced) are listed on Schedule 9 of the Wildlife and Countryside Act 1981 under which it is an offence to plant or otherwise cause to grow in the wild the scheduled species. Two are marine, thirteen (plus all species of *Elodea*) aquatic and the remainder terrestrial.

6.2 Wild Mammals

Under the Wild Mammals (Protection) Act 1996 it is an offence to mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

6.3 Badgers

Badgers are protected under the Protection of Badgers Act 1992. This Act makes it illegal to wilfully kill, injure or take any badger, or attempt to do so and it is an offence to intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett or disturb a badger when it is occupying a sett.

6.4 Water Voles

The water vole (*Arvicola terrestris*) receives protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under the Act it is an offence to intentionally kill, injure or take water voles and intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or

obstruct access to any structure or place used by water voles for shelter or protection or to disturb water voles while they are using such a place.

6.5 Birds

In Britain all wild birds are granted legal protection under the Wildlife & Countryside Act 1981 (as amended) and the EC Birds Directive. This legislation protects the birds, their eggs and nests whilst being built or in use.

Legal protection makes it an offence to intentionally kill, injure, take or have in possession any wild bird or egg. It is also an offence to intentionally damage or destroy the nest of any wild bird whilst it is being built or in use. Birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) are subject to special penalties and are also protected from disturbance while nesting including the disturbance of dependent young.

6.6 Reptiles

The slow-worm (*Anguis fragilis*), grass snake (*Natrix natrix*), adder (*Vipera berus*) and common lizard (*Lacerta vivipara*) are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) in respect of section 9(1) and 9(5) only. Under section 9(1) it is an offence to knowingly kill or injure a reptile. Section 9(5) refers to sale and trade.

6.7 Invertebrates

Statutory protection in Great Britain is provided by the Wildlife and Countryside Act 1981. The invertebrates which have special protection are listed on Schedule 5 under which it is an offence to intentionally kill, injure or take these invertebrates and intentionally or recklessly damage or destroy, or obstruct access to, any structure or place used for shelter or protection or disturb any such animal while occupying such a structure or place.

7.0 BIODIVERSITY CONSERVATION

In 2002, the Department of Farming and Rural Affairs (DEFRA) published a list of principally important species and habitats for the purposes of conserving biological diversity in England under Section 74 of the Countryside and Rights of Way Act 2000 in accordance with the 1992 UN Convention on Biological Diversity. This has subsequently been carried forward under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* sets out the means by which the Government will comply with its duty under Section 41 of the NERC Act to take or promote the taking by others of steps to further the conservation of listed habitats and species, including through the continued implementation of Action Plans.

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APPENDIX II

ECOLOGICAL EVALUATION TECHNIQUES

APPENDIX II: Evaluation techniques

1.0 INTRODUCTION

A number of systems and criteria are available to assess the nature and extent of ecological interest found at any site. Guidelines for Ecological Impact Assessment have been prepared by the Institute of Ecology and Environmental Management (2006), which have been employed below. The IEEM guidelines detail a recommended approach to the valuation of ecological receptors on the following scale:

- International importance
- UK importance
- National importance (England/Northern Ireland/Scotland/Wales)
- Regional importance
- County (or Metropolitan)
- District (or Unitary Authority, City or Borough)
- Local or Parish; and/or
- Within immediate zone of influence only

2.0 HABITATS AND FEATURES

Internationally important habitats are considered to be those listed on Annex I of the Habitats Directive. All internationally important examples, however, should have been designated within Special Areas for Conservation (SACs). Other examples should be considered to be of value at the level for which they are designated (see below). There are published guidelines for the selection of SACs (see Brown *et al*, 1997) and SPAs and Ramsar Sites (Stroud *et al*, 1990).

There are similar published criteria for the selection of nationally important Sites of Special Scientific Interest (SSSIs) (NCC, 1989) which give criteria for both habitats and species.

The majority of Local Authorities have a system of 'second tier' sites which do not wholly fulfil SSSI designation criteria, but which are, nonetheless, of local to regional value. Policies, encouraged by Government advice, recognise that protection should be extended beyond the statutory sites to include the best examples of wildlife habitats, populations of rare species and geological features remaining in the District and are particularly valuable in supplementing and supporting the national framework for SSSIs. DEFRA (2006) has published Guidance on their Identification, Selection and Management of such sites. The Hedgerow Regulations (1997) provide a useful framework for the assessment of the ecological importance of hedgerows.

It is possible that there may be habitats that do not fall within designated sites but are considered to meet the published selection criteria. Similarly it is possible that habitats within designated sites may not fulfil the criteria for designation in their own right. This may be due to the site having deteriorated or that they have been included for other reasons such as secondary or supporting value. If a habitat is considered to be in an unfavourable condition, consideration must be given to its potential value if restored. Consideration should also be given to secondary or

supporting value where a habitat or feature may have no particular interest in itself but may perform an important ecological function such as a buffer against negative impacts or an important link between habitats. The presence of a diverse range of habitats can increase the value of a site.

3.0 SPECIES

A number of resources are available to assess the rarity and vulnerability of individual species. **Red Data Lists** utilise standard criteria defined by the International Union for the Conservation of Nature (IUCN, 2001, now the World Conservation Union, WCU) to classify the scarcity and conservation status of species of flora and fauna. The Red Data List system can operate at an International, National or Regional level (e.g. County Red Data Lists). The IUCN maintains a list of threatened species on a global scale.

The IUCN threat categories are defined as follows: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD) and Not Evaluated (E). Species falling within the categories CR, EN and VU are considered to be threatened. These categories are defined by five criteria as follows:

- Criterion A considers the percentage decline of a taxon, regardless of current range or abundance.
- Criterion B is designed to identify threats associated with extremely restricted distribution when combined with other risk factors.
- Criterion C considers the combination of extremely small population size with similar risk factors to Criterion B.
- Criterion D identifies very small or restricted populations.
- Criterion E requires quantitative analysis to estimate the extinction probability of a taxon based on known life history, habitat requirements, threats and any specified management options.

Earlier Red Data Lists and Books (such as the British Red Data Book for Insects (Shirt 1987) and subsequent reviews: Falk, 1991 and Hyman and Parsons, 1992) classified species on the former IUCN criteria as: Extinct, Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3) and insufficiently known (RDBK).

Criteria for the selection of Nationally Notable insects (now termed Nationally Scarce) species generally follow Eversham (1983). These Nationally Notable/Scarce species are further divided into Notable A (present in 16-30 squares) and Notable B (31-100 squares).

Rare birds in Britain are defined as any species for which records would have to be verified by the British Birds Rarities Committee. County rarities are taken to include all national rarities and also any species listed in County bird reports requiring a full description, which should be submitted to the relevant County Recorder. The presence of rare birds at any time of year, including locally rare species, adds significantly to the ecological value of a site. In general, however, only rare birds with a regular pattern of occurrence at a site should be included in this category.

National and County distribution atlases and species reports such as county bird reports can provide valuable additional information for evaluation. They can also provide information on species status at the level of geographic coverage of the atlas. Species at the edge of their distribution (especially in the context of global change) and notably large populations of species that are uncommon or threatened in the wider context enhances a species value. A species that is rare and declining should be assigned a higher level of importance than one that is stable. Other rarity related evaluation criteria include the need to protect populations for which the UK holds a large / significant proportion of the international / European population. The presence of a diverse assemblage of species can enhance the value of a site.

Further guidance on the evaluation of certain protected species has been published by English Nature e.g. *Great Crested Newt Mitigation Guidelines* (EN, 2001) and *Bat Mitigation Guidelines* (Mitchell-Jones, 2004) and non-statutory organisations e.g. Froglife (1999, endorsed by English Nature).

4.0 OTHER RESOURCES

4.1 *Natural Areas*

English Nature (now Natural England) has divided England into 120 '*Natural Areas*' described as areas of the countryside identified by their unique combination of physical attributes, wildlife, land-use and culture (English Nature, 1998). Natural Areas provide a useful framework for assessing species and habitats beyond the traditional administrative boundaries. In the UK Biodiversity Action Plan they are described as:

"... biogeographical zones which reflect the geological foundation, the natural systems and processes and the wildlife in different parts of England, and provide a framework for setting objectives for nature conservation"

The Natural Area profiles provide contextual information to confirm temporal and spatial scope. They can provide information to aid evaluation of the relative importance of ecological receptors.

4.2 *Biodiversity Action Plans*

The **UK Biodiversity Action Plan** (UK BAP) published in 1994 (UK Biodiversity Steering Group, 1995-1999) highlighted 38 key habitat types (now termed priority habitats), which were subsequently revised to include 26 non-maritime and 19 maritime priority habitats. A review was undertaken in 2007 resulting in the publication of a new list comprising 1,149 priority species and 65 priority habitats (40 terrestrial and 25 maritime).

Under the 2007 review, priority habitats were selected according to the following criteria:

1. Habitats for which the UK has international obligations;
2. Natural and semi-natural habitats at risk, such as those with a high rate of decline in extent and/or quality, especially over the last 20 years, or which are rare;
3. Habitats important for assemblages of key species.

4. Habitats which are 'functionally critical' i.e. those 'essential for organisms inhabiting wider ecosystems', may be useful in some cases as a supporting criterion but is unlikely to be a qualifying criterion in its own right.

Priority species were selected against the following criteria:

1. International threat;
2. International responsibility (of the UK) + moderate decline in the UK;
3. Marked decline in the UK; or
4. Other important factor(s).

Following the establishment of devolved governments in Scotland, Wales and Northern Ireland in 1998, each country produced its own biodiversity strategy. In 2002, DEFRA published *Working with the Grain of Nature: a biodiversity strategy for England*. This has since been superseded by *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* (DEFRA, 2011) which builds on the Natural Environment White Paper (2011) and provides a comprehensive picture of how the Government is implementing its commitments under the Convention on Biological Diversity and the EU Biodiversity Strategy in England. It sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea.

Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006 requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The Government has a duty to take reasonably practicable steps to further the conservation of the species and habitats that are included in lists published under Section 41. The S41 list includes all the habitats and species in England identified as requiring action under the UK BAP with the addition of hen harrier which, without continued conservation action, it is considered unlikely that its population will increase from its current very low levels in England.

Biodiversity Action plans at lower levels such as regional and county have also been produced for many areas.

Selection of habitats and species for BAPs is on the grounds that they are in a sub-optimal state and does not imply any specific level of importance of a habitat or species. The value of priority habitats and species should be determined as described above. Only where a specific habitat or species action plan states that all areas of a particular habitat or all populations of a given species should be protected should the habitat or species be valued at the appropriate level of the BAP. BAPs can assist in ecological evaluation but must be reviewed on a case by case basis.

4.3 Bird Species of Conservation Concern

Bird Species of Conservation Concern in the UK, Channel Islands and Isle of Man was first published in 1996, updated in 2002 (Gregory *et al*, 2002) and again in 2009 (Eaton *et al* 2009). The list is prioritised into species of high (red) and medium (amber) conservation concern; all other species are of lower (green) concern. Red-listed species are globally threatened according to IUCN (World Conservation Union)

criteria or in rapid decline (greater than 50% over the past 25 years) in the UK, currently or historically and those that have declined historically and not shown a substantial recent recovery. Amber listed species are in moderate decline (25-49% over the past 25 years), rare breeders, localised or internationally important populations, of an unfavourable conservation status in Europe or those whose population has declined historically but made a substantial recent recovery. It should be noted that despite substantial declines, many red-listed species such as skylark (*Alauda arvensis*) and song thrush (*Turdus merula*) remain relatively common in the UK countryside. As for BAPs, inclusion of species on one of the lists is not sufficient in itself for assigning a level of value to the species concerned. Each species should be evaluated according to the guidelines above with reference to the criteria for inclusion of the species.

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APPENDIX III

SURVEY PHOTOGRAPHS

APPENDIX III: SURVEY PHOTOGRAPHS



Photograph 1: View west of Field 1. Note the recently harvested arable land and dense but gappy hedgerows.



Photograph 2: The access track and line of semi-mature/mature trees



Photograph 3: Example of boundary hedgerow. Note the unmanaged arable margin which fringe the arable fields.



Photograph 4: Un-harvested area of flax as discussed in Target Note 4.



Photograph 5: Vegetated drainage ditch. The ditches within the application site were generally smaller and less wet than the boundary ditches/watercourses.



Photograph 6: View east along Ryebank Rife. Note the extent of the watercourse and the dense vegetation. The northern bank (within the application site) had been recently mown.



Photograph 7: Close up of drainage ditch. Note the steep sides and duckweed.



Photograph 8: Belt of mixed woodland within the application site



Photograph 9: Semi-improved grassland



Photograph 10: Existing building within the site, South Barn

APPENDIX IV

TARGET NOTES

APPENDIX IV: TARGET NOTES

Target Note 1

South Barn is the only existing building within the application site. It is located centrally within the application site adjacent to the main access track off Drove Lane. It comprises a single large brick/stone barn with tiled roof. The barn presents potential habitat for roosting bats both internally and externally. The barn was accessed for a preliminary survey. Extensive piles of desiccated barn owl pellets were identified.

Target Note 2

A barn owl box was sited on a mature tree.

Target Note 3

Two long banks of loosely compacted earth bisect Field 4. These represent potential basking/hibernating sites for reptile and amphibian species.

Target Note 4

The western section of Field 1 had not been harvested and was covered in a dense crop of common flax.

Target Note 5

The watercourse which bounds the application to the south is the Ryebank Rife. This watercourse is classed as a main river by the Environment Agency.

Target Note 6

The watercourse which bounds the application to the west is the Lidney Rife. This watercourse is classed as a main river by the Environment Agency.

Target Note 7

Ordnance survey (OS) maps indicate a small pond is located approximately 250 m east of the application site. The pond could not be located during survey and may have disappeared or be ephemeral/seasonal in nature. This pond and its immediate surroundings were surveyed for reptile and amphibian species in 2008 to inform the development of an adjacent water storage reservoir (B. Kemp Conservation, 2008).