
Winwick Warren Wind Farm, Scoping Request, Supporting Information

1. Planning Policy Context

- 1.1.1 This section briefly outlines the planning policy framework for the development of Winwick Warren Wind Farm. It does not contain an in-depth discussion of specific policies but outlines the key policy documents against which proposals will be assessed.
- 1.1.2 Relevant, specific policies contained in these policy documents will be fully documented in the Environmental Statement (ES). A separate Planning Statement reviewing the extent to which the planning application complies with these policy documents will also be prepared as part of the overall suite of application documents.

1.2 Renewable Energy Policy

- 1.2.1 The direction of UK policy on renewable energy is guided by Government commitments to international and European climate change instruments. The UK Government is a signatory to the convention of the Intergovernmental Negotiating Committee on Climate Change that was signed at the United Nations (UN) Conference on Environmental Development - The Earth Summit held in Rio de Janeiro in June 1992.
- 1.2.2 Commitments at the Earth Summit were not legally binding on the signatories. However, at the Third Conference of the Parties to the Convention on Climate Change held in Kyoto in December 1997, a protocol was adopted which set binding targets on industrialised nations to reduce their emissions of six greenhouse gases to 5.2% below 1990 levels over the period 2008-2012. The Member States of the European Union (EU) jointly agreed to exceed this commitment by requiring a reduction in greenhouse gas levels of 8% over 1990 levels during the time period.
- 1.2.3 The contribution to this target differs for each Member State and the UK accepted a legally binding target of a 12.5% reduction.

EU Renewable Energy Directive

- 1.2.4 In spring 2007 the EU heads of Government agreed to a binding target of 20% of EU energy consumption to come from renewable sources by 2020. This target was agreed by the European Parliament in December 2008. Each Member State has therefore agreed to a binding target ranging from 10% to 49% with the UK target being 15%. This target is included within the draft EU Renewable Energy Directive for which legislative procedures are expected to be completed early 2009.

Climate Change Act

- 1.2.5 Most recently the Climate Change Bill became the Climate Change Act when it was given Royal Assent in November 2008. The two key aims of this are (i) to improve carbon management and help a transition towards a low carbon economy in the UK and (ii) to demonstrate strong UK leadership internationally by signalling that we are committed to taking our share in reducing global emissions.
- 1.2.6 The key relevant provision of the Act is the legally binding targets of an 80% reduction of greenhouse gas emissions by 2050 and a 26% reduction of carbon dioxide emissions by 2020 both against a 1990 baseline.

UK Renewable Energy Strategy: Consultation Document 2008

- 1.2.7 In 2008 the UK Government Department for Business Enterprise and Regulatory Reform (BERR) produced a consultation document which looks at how the UK can meet its proposed share of the EU 2020 target for renewable energy in the most cost effective way. The final document is due to be published in spring 2009.
- 1.2.8 The document suggests the main policy for achieving carbon reductions should involve putting a price on carbon but to also encourage behavioural change and to support specific low-carbon technologies. It is highlighted that to meet the EU target by 2020 the UK will have to increase the energy coming from renewables ten-fold from 2006 levels with wind power expected to be the key area of growth, both on-shore and off-shore.

Regional Energy Strategy

- 1.2.9 The East Midlands Energy Challenge was published in two parts and is the current renewable energy strategy for the region, although it is due to be updated. One of the Sustainable Development Objectives within Part 1 of the strategy is to develop the region's renewable energy resource, reducing dependency on non-renewable sources. The report on Regional Targets and Scenarios for Renewable Energy published in 2006 highlighted that the East Midlands was the region with the lowest installed capacity of renewables equating to 2% of the region's energy consumption.
- 1.2.10 Policy ENG 11 of the Regional Energy Strategy seeks *"to promote and support a growing market in renewable energy electricity generation."*

1.3 National Planning Policy

- 1.3.1 Delivering Sustainable Development Planning Policy Statement 1 (PPS1) sets out the Government's vision for planning and the key objectives and principles which should underpin the planning system. Planning for sustainable development should include social cohesion and inclusion, protection and enhancement of the environment, and prudent use of natural resources, as well as sustainable economic development, and the integration of sustainable development into Development Plans. Delivering sustainable development requires the need for good design and community involvement.

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- 1.3.2 The PPS1 supplement, Planning and Climate Change, refers more specifically to climate change and provides guidance for the production of Regional Spatial Strategies (RSS) and Local Development Frameworks (LDFs). Policies should be designed to promote and not restrict renewable and low-carbon energy and supporting infrastructure. Planning authorities should “*not require applicants to demonstrate the overall need for renewable energy and its distribution, or why such development must be sited in a particular location; ensure that any local approach to protecting landscape and townscape does not preclude the supply of any type of renewable energy other than in the most exceptional circumstances; and consider identifying suitable areas for renewable low-carbon energy sources but take care to avoid stifling innovation including by rejecting proposals because they are solely outside areas identified.*”
- 1.3.3 PPS7: Sustainable Development in Rural Areas sets out the Government's planning policies for rural areas, including country towns and villages and the wider, largely undeveloped countryside up to the fringes of larger urban areas. Paragraph 16 states that when preparing policies for LDFs and determining planning applications for development in the countryside, local planning authorities should: provide for the sensitive exploitation of renewable energy sources in accordance with the policies set out in PPS22 Renewable Energy.
- 1.3.4 Government planning guidance with regard to renewable energy is contained within PPS22 issued in 2004. The document sets out the Government's commitment to cut carbon dioxide emissions and to maintain reliable and competitive energy supplies. It states that renewable energy is likely to make a key contribution to these aims. Positive planning which facilitates renewable energy developments is considered to contribute to all four elements of the Government's sustainable development strategy, namely:
- Social progress - by ensuring that all homes are adequately and affordably heated;
 - Effective protection of the environment - reducing greenhouse gas emissions;
 - Prudent use of natural resources - reducing reliance on fossil fuels; and
 - Maintaining high and stable levels of economic growth and employment - through the creation of jobs and development of new technologies.
- 1.3.5 Regional and local planning bodies are required to develop policies to promote and encourage, rather than restrict renewable energy production, whilst at the same time ensuring appropriate environmental safeguards. At an early stage in the planning process developers are encouraged to consult and discuss their plans with local communities. The wider economic and environmental benefits of proposals should be given significant weight when determining whether to grant planning permission.
- 1.3.6 A number of other Planning Policy Guidance Notes (PPG) and PPS, which set out the approach that the Government expects to be taken on a wide range of

planning issues, are also relevant to Winwick Warren Wind Farm as noted in the technical sections contained in this document.

1.4 Regional Planning Policy

Regional Spatial Strategy for the East Midlands

- 1.4.1 One of the key objectives set out in Policy 1 of the RSS for the East Midlands, published in March 2005, is the promotion of the prudent use of resources through, amongst others, maximising the role of renewable energy generation.
- 1.4.2 Paragraph 4.3.55 sets out the regional targets for renewable energy excluding energy derived from incineration of municipal waste and commercial waste. The proposed minimum regional energy target is 2,495 GWh by 2010 and nearly 5,000 GWh by 2020. It states that at present [2005] renewable energy sources made a contribution of approximately 1.6% and the proposed targets represent 10.6% of the overall electricity consumption at 2010. The RSS states that its regional targets are ambitious, but are thought to be realistic and should be treated as indicative. It adds, that *"it should not be inferred that once these targets have been met within an area, efforts should not continue to deliver additional renewable schemes"*.
- 1.4.3 Paragraph 4.3.58 refers specifically to wind turbines and states that much of the region could be suitable for such a development, subject to certain criteria, including visual impact, cumulative effect and size. It is also stressed that planning authorities should not adopt policies that would in effect impose a blanket ban on on-shore wind energy projects and that policies should be included in development plans which guide and inform wind energy projects in order to achieve high quality, well planned developments.
- 1.4.4 Policy 41 establishes the criteria for onshore wind energy which should be considered in Development Plans and future LDFs:
- Landscape and visual impact, informed by local Landscape Character Assessments;
 - The effect on the natural and cultural environment (including biodiversity and the setting of historic assets);
 - The effect on the built environment (including noise intrusion);
 - The number and size of turbines proposed;
 - The cumulative impact of wind generation projects, including intervisibility;
 - The contribution of wind generation projects to the renewables target; and
 - The contribution of wind generation projects to national and international environmental objectives on climate change.
- 1.4.5 The RSS is currently being reviewed. A draft review was published for consultation in September 2006 and a Public Examination took place. On 22 July 2008 the Secretary of State for the Department for the Communities and

Local Government (DCLG) published the Proposed Changes for consultation until October 2008. The comments made during this consultation are currently being analysed and it is expected the Secretary of State will issue a final version of the plan in 2009.

Northamptonshire Structure Plan 1996-2016

- 1.4.6 Under the provisions of the Planning and Compulsory Purchase Act 2004 Structure Plans are being replaced by RSSs and LDFs. However, as a transitional arrangement some of the Northamptonshire Structure Plan policies have been saved.
- 1.4.7 Saved Policy *GS5 Design* requires development to be of high quality and integrate sustainable development, whilst being appropriate in scale and location to its setting.

1.5 Local Planning Policy

- 1.5.1 The application site is located in the jurisdiction of Daventry District Council. The Daventry Local Plan was adopted in June 1997. Under the provisions of the Planning and Compulsory Purchase Act 2004 certain policies within the plan remain saved. The key relevant saved policies are:
- Policy GN1: General Policy One: The granting of planning permission for development
 - Policy GN2: General Policy Two: Determining Planning Applications
 - Policy ENV1: Special Landscape Areas
- 1.5.2 The Daventry and South Northamptonshire Energy and Development Supplementary Planning Document, adopted March 2007 would also be a key consideration for the proposed development.
- 1.5.3 At current a Joint West Northamptonshire LDF is currently being produced. The Core Strategy is due to be adopted in January 2011.

2. Landscape Character and Visual Amenity

2.1 Policy Context

- 2.1.1 The Landscape and Visual Assessment (LVA) will be undertaken with reference to a number of best practice documents. Several of these have been published by Scottish Natural Heritage (SNH) but with regard to landscape and visual assessments of wind farm proposals it is widely accepted that the approaches outlined in these documents are applicable throughout the UK. In particular reference will be made to methodological approaches set out in the following publications:
- Guidelines on Environmental Impacts of Wind Farms and Small Scale Hydro Electric Schemes. SNH. 2001;

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- Visual Assessment of Wind Farms: Best Practice. University of Newcastle. SNH Report No. F01AA3030A. 2002;
 - Guidelines on Landscape and Visual Impact Assessment (GLVIA)¹. Second Edition. The Landscape Institute and Institute of Environmental Management and Assessment. 2002;
 - Cumulative Effect of Wind Farms: Guidance. Version 2. SNH. April 2005; and
 - Landscape Character Assessment: Guidance for England and Scotland. University of Sheffield and Land Use Consultants. The Countryside Agency and SNH. 2002.

2.2 Baseline Overview

2.2.1 The landscape assessment will consider the effects of the proposed wind farm on existing landscape character, patterns and elements within a defined study area (specified to include all areas within 30km of any proposed turbine rather than the site centre). The focus of the assessment will be on the areas closest to the application site where effects have the potential to be of the greatest magnitude (a radius of 10km from any proposed turbine), referred to as the detailed study area. Indicative defined² and detailed³ study areas are shown on **Figure 2**.

Landscape Designations

2.2.2 There are no national landscape designations (National Parks and Areas of Outstanding Natural Beauty) within the study area, but several local authorities retain local landscape designations in their saved local plan policies, which may be carried through into their emerging Local Development Framework (LDF) documents.

Landscape Character

2.2.3 At a national and regional level landscape character assessment is based upon the 159 National Character Areas (NCAs) that were identified by the then Countryside Commission in their 'Character of England' project. Detailed descriptions were subsequently published in a series of regional gazetteers such as 'Countryside Character Volume No.4: East Midlands'. With regard to the proposed Winwick Warren Wind Farm the defined (30km) study area

¹ We are aware that consultations are underway to revise the GLVIA for a third edition and if this is published during the lifespan of this Environmental Impact Assessment (EIA) its contents will be incorporated into the LVA.

² The defined study area comprises a site-centred, 31km radius circle enclosing all areas within 30km of a potential turbine location.

³ The detailed study area comprises a site-centred, 11km radius circle enclosing all areas within 10km of a potential turbine location.

includes parts of the following landscape character areas: the Northamptonshire Uplands (No. 95) in which the application site is located; the Leicestershire and Northamptonshire Vales (Nos. 89 and 94); High Leicestershire (No. 93); Rockingham Forest (No. 92); Yardley-Whittlewood Ridge (No. 91); and Dunsmore and Feldon (No. 96). With regard to the proposed Winwick Warren Wind Farm, both Northamptonshire and Warwickshire County Councils and the local authority covering the closest part of Leicestershire; Harborough District Council, have produced landscape character assessments.^{4,5,6}

2.3 Proposed Scope of Assessment

Landscape Assessment

- 2.3.1 The landscape assessment will include direct and indirect effects upon landscape elements and patterns within the application site such as hedgerows and the field boundary pattern, as well as effects upon the detailed landscape character of the application site and its immediate context, including its condition and capacity.

Landscape Designations

- 2.3.2 The landscape assessment will assess the potential direct and indirect effects upon landscape designations, concentrating upon those within the detailed 10km radius study area, where experience indicates that potential significant landscape effects are most likely to occur. With regard to designations which have a landscape and a cultural heritage dimension, such as listed buildings, scheduled monuments, registered historic parks and gardens and registered battlefields, Entec has developed an approach whereby the integrity and setting of the designated site is assessed within the cultural heritage assessment.

Landscape Character

- 2.3.3 The final part of the landscape assessment will be concerned with potential direct and, more often, indirect effects upon defined landscape character. The national and regional level landscape character areas provide a good starting point for this aspect of the landscape assessment. However, as a consequence of the scale at which they are defined, such areas tend to be relatively extensive and experience of using them as receptors within landscape assessments has fostered a view that their scale is such that a single development is highly unlikely to have significant effects at the NCA scale. In addition, the past decade has seen many county and local

⁴ Current Landscape Character Assessment as included in Northamptonshire's Environmental Character and Green Infrastructure Suite.

⁵ Warwickshire Landscape Guidelines, Warwickshire County Council, 1993.

⁶ Harborough District Landscape Character Assessment. September 2007.

authorities produce their own landscape character assessments which provide a much finer grain of detail and identify landscape character types and/or landscape character areas at a more relevant scale. These are much more likely to be affected by a single development such as a wind farm. It is therefore proposed to scope out an assessment upon the NCAs and concentrate the landscape assessment upon the landscape character areas that have been defined within the local studies^{7,8,9} and which are partly or completely located within the detailed (10km) study area. This is an approach we have used successfully on over twenty wind farm LVAs in England and Wales in the past four years and avoids burdening the LVA with large amounts of less pertinent information.

Visual Assessment

- 2.3.4 Visual effects are recognised by the Landscape Institute as being a subset of landscape effects and are concerned wholly with the effect of a proposed development upon the views and the visual amenity of visual receptors: people, who live, work, undertake recreational activities or travel through the study area. Visual receptors are categorised by their visual sensitivity to change in accordance with their principal activity in line with the GLVIA.
- 2.3.5 Some visual assessments are based completely or substantially upon a detailed assessment of a limited number of viewpoints from where the likely effects upon visual receptors are illustrated by photomontages and/or wireframes. Entec's approach for Winwick Warren Wind Farm, whilst making extensive use of such visualisation techniques, would be to identify a much wider range of visual receptors either as individuals (e.g. at every residential property within 3km of a turbine), or amalgamated into groups (e.g. all the residents of a particular village or hamlet or discrete networks of public Rights of Way).
- 2.3.6 Once identified, the predicted magnitude of visual change that would be sustained by the visual receptors will be assessed using information gained from site visits, visualisations such as wireframes and Zones of Theoretical Visibility maps (ZTVs). In accordance with the approach set out in the GLVIA the magnitude of visual change will be combined with the sensitivity of the visual receptor (as accorded within the GLVIA) to produce a level of visual effect. There are seven potential levels of visual effect, two of which ('substantial' and 'moderate/substantial') are assessed as being 'significant' in the context of the EIA Regulations (England and Wales), 1999.

⁷ Current Landscape Character Assessment as included in Northamptonshire's Environmental Character and Green Infrastructure Suite.

⁸ Warwickshire Landscape Guidelines, Warwickshire County Council, 1993.

⁹ Harborough District Landscape Character Assessment. September 2007.

Zones of Theoretical Visibility

- 2.3.7 The selection of which visual receptors are to be included within the visual assessment will be guided by a series of ZTVs. These are generated by a computer programme¹⁰ that uses a digital model of the tallest potential turbine type in conjunction with a digital terrain model (DTM)¹¹ to calculate locations from where either the turbines' nacelles or upper blade tips would theoretically be visible. In some locations the extent of woodland cover is such that it is likely to have a strong influence upon the availability of receptors' views and it is necessary to amend the DTM to make allowance for this influence. However, the preliminary baseline studies for the Winwick Warren Wind Farm study area indicate that the level of woodland cover would not justify such an exercise in this instance. ZTVs will be produced to illustrate theoretical visibility of the proposed turbines at both upper blade tip height (maximum 126.5m) and hub height (maximum 80m) as well as at a height of 2m above ground for all on-site elements during the construction period. The latter ZTV will help in the assessment of potential visual effects likely to arise during the comparatively short-lived construction period and the access tracks and other limited operational infrastructure.
- 2.3.8 Entec has employed an indicative turbine layout to produce preliminary maps of the ZTV of the proposed wind farm at both blade tip (126.5m) and hub height (80m) within the defined study area. The ZTVs are included as **Figures 3 and 4**.

Visualisation Viewpoints

- 2.3.9 Key to the detailed visual assessment will be the production of visualisations in the form of photomontage and wireframe views. These visualisations should illustrate the magnitude of visual change likely to be associated with a range of viewpoint locations. Ideally they will illustrate views from those locations likely to experience the highest magnitudes of visual change, the likely visual change at particularly sensitive receptors and a range of locations representative of different distances and directions from the site. Entec appreciates the contribution to be made by consultees in drawing up a schedule of such viewpoint locations.
- 2.3.10 Entec has identified a preliminary list of potential viewpoint locations based upon an initial review of the defined study area. This review drew upon a desk-based study, the preliminary ZTVs, local knowledge and an initial site survey. The proposed viewpoints are listed in **Table 2.1** below and illustrated on **Figures 3 and 4**.
- 2.3.11 Previous experience has shown that photomontages best illustrate the changes to views from viewpoints relatively close to the application site, while wireframe views are better suited to highlighting the smaller-scale changes associated with more distant views. On the basis of the preliminary list of

¹⁰ Resoft Windfarm Release 4.

¹¹ Ordnance Survey 'Panorama' data, providing a 50m grid derived from the OS 1:50,000 scale contours.

viewpoint locations given in **Table 2.1**, Entec would anticipate that viewpoints 1 to 14 would be illustrated by photomontages and the remainder with wireframe views.

Table 2.1 Proposed Photomontage and Wireframe Viewpoint Locations

Viewpoint No. and Location	Indicative Grid Reference	Approximate Distance to Site Centre (km)	Reason for Selection
Photomontage Viewpoints			
1. Winwick	SP627738	1.5	A location on the Jurassic Way on the eastern edge of the settlement. Representative of views available to residents of the closest settlement to the application site and to users of the regional trail at its nearest point to the application site. Within the Daventry Special Landscape Area (SLA).
2. Jurassic Way on Honey Hill	SP638767	2.0	An elevated location to the north of the application site. Representative of views available to users of the regional trail and residents of the dispersed properties in this area. Within the Daventry SLA.
3. Cold Ashby	SP652762	2.1	A location on the south-western edge of the settlement. Representative of views available to local residents.
4 Grand Union Canal at Winwick Grange	SP627742	2.1	Ideally on the canal bridge representing views for users of canal and inhabitants at the Grange plus in Conservation Area
5. Jurassic Way near West Haddon	SP629721	2.7	A location at the village edge to the south of the A428. Representative of views available to users of the regional trail and of close-distance views from the south, especially residents on northern edge of the village.
6. Thornby	SP668756	3.0	A location on the western edge of the settlement. Representative of views available to local residents. Within the Daventry SLA.
7. Guilsborough	SP668735	3.1	A location on the north-western edge of the settlement. Representative of views available to local residents. Within the Daventry SLA.
8 Cracks Hill near Crick	SP597735	4.2	Representative of views from one of largest settlements in the detailed study area and close to the Grand Union Canal.
9. Yelvertoft	SP599759	4.3	A location on the eastern edge of the settlement. Representative of views available to local residents and middle-distance views from the west.
10. Ravensthorpe	SP670705	5.1	A location on the northern edge of the settlement. Representative of views available to local residents and of middle-distance views from the south. Within the Daventry SLA.

Viewpoint No. and Location	Indicative Grid Reference	Approximate Distance to Site Centre (km)	Reason for Selection
11. Minor road bridge over A14 near Naseby	SP681785	5.7	Representative of views available within the Naseby registered battlefield, to those travelling through the area and of middle-distance views from the north-east.
12. Jurassic Way east of Welford	SP644803	6.5	The 149m high spot represents views from this large village, this section of the Jurassic Way and the part of the ZTV north of A14 in general.
13. Cottesbrooke Hall and Park	SP705743	6.6	A location on a minor road in the western portion of the registered park. Representative of views available within the Park and of middle-distance views from the east. Within the Daventry SLA.
14. Park around Stanford Hall	SP586800	7.5	Gravel Hill. An elevated location on the bridleway that runs through the registered park. Representative of views available within the Park and of middle-distance views from the north-west.

Wireframe Viewpoints

15. Jurassic Way at Ashby St. Ledgers	SP574681	9.2	A location on the eastern edge of the settlement, on the Jurassic Way as it passes through the registered garden. Representative of views available to local residents, users of the regional trail, views from the garden and middle-distance views from the south-west.
16. Brixworth	SP747712	11.2	A location on the north-western edge of the settlement, in the vicinity of the listed Saxon church. Representative of views available to local residents and middle-distance views from the south-east.
17. Newton	SP530785	11.6	A location in the vicinity of the picnic area to the north of Newton, to the north-east of Rugby. Representative of views available to users of the picnic area and the local footpath network and of middle distance views from the west.
18. Daventry	SP580643	11.9	A location within the country park on the north-eastern edge of the settlement. Representative of views available to users of the park and middle-distance views from the south-west.
19. Great Oxendon	SP731834	12.1	152m high point at western end of Main Street representative of middle distance views from settlements in fragmented ZTV to north-east.
20. Gilmorton	SP573876	14.5	A location on the southern edge of the settlement. Representative of views available to local residents and longer-distance views from the north-west.
21. Desborough	SP787834	17.1	Minor road bridge over the A6 to the west of Desborough. Representative of views available in the vicinities of Desborough and Rothwell.
22. Shuckburgh Hills	SP488009	20.6	Beacon Hill 205m high point. Representative of the distant views available to some residents in settlements in the south-west of the study area.

Viewpoint No. and Location	Indicative Grid Reference	Approximate Distance to Site Centre (km)	Reason for Selection
23. Yardley Chase	SP832560	26.8	A location in the vicinity of Horton. Representative of distant views from the south-east.

Visual Amenity

2.3.12 In addition to the comprehensive visual assessment emerging best practice encourages the assessment to also consider the potential for some close by residential visual receptors to sustain adverse effects upon their visual amenity. For example a sense that turbines are excessively close and/or surround the property could lead to a curtailment of viable activities in particular rooms or parts of the property such as patios or outdoor swimming pools. Hence the assessment will include site surveys using proformas to ascertain in greater detail the potential visual effects taking into account variables such as the orientation of a property and its residents' principal views, the distribution of windows and the amount of nearby potential screening vegetation. As such effects are most likely to affect properties in close vicinity to the turbines the residential amenity survey will be restricted to individual properties within 3km of any turbine. Also, as with all aspects of the LVA, the amount of information that can be gained in field surveys will be limited by the availability of public access and in some cases the relevant information may have to be interpreted from aerial photographs. The completed proformas will be used to inform the visual assessment of these residential receptors.

Cumulative Effects

2.3.13 Further advice on the scope of cumulative assessments for wind farm developments is currently being developed by Entec for Department of Energy and Climate Change (DECC). This may well see new advice being published on the scope of cumulative assessments. This advice will be followed if it becomes recommended by DECC. In the absence of such information Entec proposes that the cumulative study area, within which cumulative landscape or visual effects will be assessed should be 60km (i.e. including all points which could be within 30km of both the proposed Winwick Warren Wind Farm and any another wind farm site). Sites to be considered within the assessment are proposed to be those that are already built or under construction, those consented but not yet built and those for which a detailed planning application has been submitted but not yet determined. Sites which may be at screening and scoping stages are proposed to be excluded on the basis that they may not progress to full applications and do not have sufficient detail available (on location and size of turbines) to allow intervisibility or sequential visibility to be assessed with any degree of certainty. Identified wind farms will be grouped in accordance with their planning status and geographical distribution to produce a number of cumulative ZTVs which indicate where one or more of these wind farms would theoretically be visible in nominal 360° views. In line

with established best practice cumulative visual effects will be considered under three sub-categories:

- Combined or simultaneous – more than one wind farm would be seen from a single static viewpoint in one 90° field of view;
- Successive or repetitive - more than one wind farm would be seen from a single static viewpoint by a receptors turning through 360° field of view; and
- Sequential – when a receptor views more than one wind farm when travelling along a route i.e. a road or a long distance footpath or cycleway.

2.3.14 Potential cumulative landscape effects will be assessed as a commentary using the range of headings that are contained in the previously referenced guidance. One of the key issues will be an assessment of the potential cumulative landscape effects of the various wind farms upon defined landscape character areas and local landscape designations. Visual cumulative effects will utilise a viewpoint based approach using the agreed visualisation viewpoints from the consultation exercise. 360° colour coded cumulative wireframes will be produced from all the visualisation viewpoints from which more than one wind farm could potentially be visible. These will be used to provide an analysis of the overall visual cumulative effect:

- With the proposed Winwick Warren Wind Farm;
- Without the proposed Winwick Warren Wind Farm; and
- The incremental effect of the addition of the turbines at the Winwick Warren Wind Farm.

2.3.15 As this is potentially a complex analysis the results will be summarised in tabular form.

Turbine Layout

2.3.16 Turbine layout options will be reviewed by the landscape consultant to ensure an appropriate landscape and visual fit. As part of this process it is envisaged wireframes will be produced from some or all of the visualisation viewpoints. These will allow recommendations for the micro-siting of the turbines to minimise the incidences of potentially adverse design features such as the clustering of turbines; the presence of isolated 'outlier' turbines or the formation of an unbalanced turbine array or excessive amounts of blade overlapping.

2.3.17 As the LVA proceeds, mitigation proposals will also be developed with regard to variables such as the location and detailed design of ancillary elements such as the control building and access routes and any potential for screen planting close to individual sensitive visual receptors.

2.4 Assessment Methodology (approach)

- 2.4.1 The LVA will clearly set out its methodology in its early sections utilising tables wherever possible to maximise its transparency and replicability.
- 2.4.2 Following on from the methodology section the LVA will present the baseline conditions in a comprehensive but succinct manner using a number of sub-headings to provide an overall analysis of the prevailing landscape and visual conditions within the defined study area and concentrating upon the detailed study area. It will review relevant landscape commentaries; the relevant sections in the landscape character assessments produced by Northamptonshire and Warwickshire County Councils and Harborough District Council; descriptions of the registered historic parks and gardens (e.g. Cottesbrook Park), scheduled monuments and listed buildings (e.g. Stanford Hall); and background information including the available studies on the Battle of Naseby. It will also review and list the relevant (i.e. saved) policies in the Daventry Local Plan and those in the emerging LDF. The baseline will be supported by a number of figures on Ordnance Survey (OS) plans and annotated photographs of the application site and its landscape setting.
- 2.4.3 As recommended by the GLVIA, the LVA will consider the potential landscape and visual effects of the proposed wind farm in separate sections.

3. Archaeology and Cultural Heritage

3.1 Policy Context

- 3.1.1 Cultural heritage is represented by a wide range of features, both above and below ground, which result from past human use of the landscape. These include standing buildings, many still in use, sub-surface archaeological remains and artefact scatters. It also includes earthwork monuments as well as landscape features such as field boundaries and industrial remains.
- 3.1.2 Certain features that are deemed to be of particular importance are given legal protection as Scheduled Ancient Monuments through the Ancient Monuments and Archaeological Areas Act 1979 (AMAAA). Similarly, the Planning (Listed Buildings and Conservation Areas) Act 1990 provides for the definition and protection listed buildings or areas of architectural and historical interest.
- 3.1.3 Further advice on how cultural heritage should be treated is given in Planning Policy Guidance 15 (PPG15) and PPG16. PPG15 deals with the historic environment, and sets out policy for the protection of features designated under the Listed Buildings and Conservation Areas Act 1990 and also gives guidance on other aspects of the historic environment for which there are no specific statutory controls; namely World Heritage Sites, historic parks and gardens and historic battlefields. PPG16 sets out policy on archaeological remains, their importance and the handling of archaeological matters in the planning process.

3.2 Baseline Overview

3.2.1 Data was obtained on features recorded within the site and a 500m envelope surrounding it from Northamptonshire Historic Environment Record (HER). In addition data on designated cultural heritage features in the surrounding area has been obtained from official registers, with a view to including those up to 5km from turbine locations in the assessment.

Designated Features

3.2.2 The nearest scheduled monument is the remains of the monastic grange east of Manor Farm (SM 17133) which lies on the north side of Cold Ashby village, some 600m to the north east of the application site. A further five scheduled monuments fall between three and 5km from the site, although none lie to the south. These are of Medieval domestic and ecclesiastical settlement, other than a cluster of prehistoric monuments, to the north of the A14, which survive only as cropmarks.

3.2.3 All listed buildings lie more than 500m from the site. The nearest are as follows:

- Eight buildings in Cold Ashby village to the north east of the site, including the Grade II* listed Church of St Denys and The Hall (listed Grade II).
- Eight buildings in Winwick, 750m and more to the south west of the site, including Winwick Manor, associated gate arch and the Church of St Michael, all listed Grade II*.
- Elkington Lodge Farmhouse, nearly 800m to the north west of the site, listed Grade II.

3.2.4 A further 27 listed buildings lie within 2km of the site and more than 200 lie between 2km and 5km from the site. The vast majority of these fall in the surrounding villages, although there are some outlying listed farmsteads, bridges and other features, including those associated with the Grand Union Canal, some 1.3km to the west of the site at its nearest point.

3.2.5 The registered battlefield which marks the site of the Battle of Naseby of 1645 lies some 3.2km to the north east of the site at its nearest point.

3.2.6 The Grade II registered historic park of Cottesbrooke Hall (2030) lies nearly 4.5km to the east of the site at its nearest point, with the Hall itself, listed Grade I, some 6.5km away.

Non-designated Features

3.2.7 The only cultural heritage features or areas of interest recorded within the site are two areas of ridge and furrow earthworks, identified by the Open Fields Project. These occupy the south western part of the site (HER 9847/0/1) and a small area within the northern spur of the site (HER 944/0/5).

3.2.8 Several archaeological features are recorded within the vicinity of the site, including the following:

-
- A possible Medieval or post Medieval rabbit warren, to the south of the site, in the vicinity of Winwick Warren farmstead (HER 1100).
 - An area of possible Neolithic/Bronze Age activity to the east of the site, identified from artefacts recovered during fieldwalking (HER 1078).
 - An area of cropmarks, with two broad foci and interpreted as enclosures, trackways and other features indicative of probable prehistoric settlement lies to the north of the site (HER 5755).
 - The cropmarks of a possible Bronze Age funerary site, including barrows, pits and linear features, are recorded to the north east of the site (HER 9862).
 - Further areas of surviving ridge and furrow earthworks are recorded in several locations around the site, the most extensive being those noted above, which extend from Winwick village into the site.
- 3.2.9 The HER maps the extent of the (non-designated) park associated with Cold Ashby Hall, which extends within 250m of the site. This includes (non-scheduled) earthworks relating to the shrunken Medieval village.
- 3.2.10 The extensive earthwork remains of Winwick Medieval village (non-scheduled) lie some 400m to the south west of the site.

3.3 Proposed Scope of Assessment

Direct Effects

- 3.3.1 The small footprint of the built development associated with a wind farm significantly lessens the potential for direct effects on cultural heritage features. Nevertheless there is some potential for such effects to occur given the apparent archaeological potential of the site. The assessment process will identify any known features and attempt to establish the potential for further unrecorded features. Where necessary, this information will be used to inform the wind farm design in order to avoid or reduce effects on identified features.
- 3.3.2 Based on the sources consulted, cultural heritage features present within the site are limited to two areas of surviving ridge and furrow earthworks. It may be that the relative absence of features represents a bias in recorded sites and/or a lack of any previous archaeological investigation. However, there is no reason to suspect the distribution of Medieval activity and it is therefore likely that any unrecorded remains, other than the remains of Medieval agriculture, would be of prehistoric and/or Roman dates. Research undertaken as part of the assessment will establish the most appropriate course of action for any further work required to assess the archaeological impact of the scheme.
- 3.3.3 It is anticipated that the appropriate micro-siting of turbines during the process of finalising the wind farm layout design will be used to avoid direct effects on cultural heritage features identified during the assessment. However, where this is not possible measures will be adopted to identify and preserve by

record any features which have not previously been recorded. This mitigation is subject to further discussion with relevant consultees, including the County Archaeological Advisor.

Effects on Setting

- 3.3.4 Effects on the setting of designated cultural heritage features and the wider historic landscape will also be considered as part of the assessment. These are normally changes to the setting of a feature, whether permanent or temporary. According to national policy guidance such effects are normally considered more relevant to designated features of national importance, such as scheduled monuments, listed buildings, registered historic parks and gardens and registered historic battlefields.
- 3.3.5 An initial appraisal of cultural heritage features suggests that the following receptors will need to be assessed further as part of the assessment:
- Listed buildings in Cold Ashby, particularly Cold Ashby Hall (401697, and surrounding non-designated park).
 - The scheduled monument of the monastic grange east of Manor Farm, Cold Ashby (SM 17133).
 - Listed buildings in Winwick, particularly Winwick Manor (404477).
 - Elkington Lodge Farmhouse (401704).
 - The registered Naseby Battlefield, including the cumulative effects of other proposed developments.
 - The registered park and garden of Cottesbrooke Hall.
- 3.3.6 No further cultural heritage features have been identified at this stage of particular note for assessment in the assessment. Cultural heritage receptors other than those mentioned appear to be either relatively well-screened or to have quite restricted settings, such that the potential for significant effects is substantially reduced. However, further research and assessment will be undertaken as part of the assessment and a brief account of the assessment of effects on all designated cultural heritage features within 5km of turbines will be presented in the Environmental Statement (ES).
- 3.3.7 No cultural heritage feature outside 5km radius about the application site has been identified whose setting is likely to be sensitive to the proposed wind farm.
- 3.3.8 The assessment of effects on the setting of cultural heritage features will be carried out in close consultation with the Landscape and Visual Assessment (LVA), with the latter particularly considering the visual amenity aspect of cultural heritage receptors.

3.4 Assessment Methodology (approach)

3.4.1 A study area extending up to 500m from the application site will be used to identify the archaeological potential of the site and any potential significant effects. The following sources of information will be consulted during the assessment:

- Detailed sites and monuments records and other relevant sources held by Northamptonshire HER;
- Relevant cartographic sources held in Northamptonshire County Record Office;
- Relevant published sources held by Northamptonshire County Record Office, Entec's library and internet sources; and
- Aerial photographs and any other information held at the National Monuments Record.

3.4.2 A site visit and walkover will also be undertaken, with the aim of identifying any visible cultural heritage features within the site, checking available records and noting general ground conditions.

3.4.3 As aerial photographic coverage of the site has been analysed by both the NMP and other county-based surveys and the resulting cropmarks plotted, it is not anticipated that detailed study of all aerial photographs, such as those held at the HER and at Cambridge University Library, will be required. The need for this will be ascertained through consultation with the HER.

3.4.4 An assessment of potential effects on the setting of designated cultural heritage features within 5km of the site will be made through a combination of documentary study, site visits (from publicly accessible areas) and wireframe illustrations. It is additionally proposed that this element of the assessment will be open to consultees, including the relevant planning officer, to encourage ongoing consultation. The aim will be to establish the current setting of features and how this might be affected, in consideration of factors such as distance, topography and available screening from vegetation and built development. Where the potential for a significant effect on setting is identified photomontage viewpoints may also be prepared. The assessment will then be made based on professional judgement with reference to a stated methodology, bearing in mind available guidance such as English Heritage's *Wind Energy and the Historic Environment, Conservation Principles Policies and Guidance and Seeing the History in the View* and any scoping responses or information arising from further consultation.

3.4.5 The assessment would include a description of the research undertaken and results obtained, as well as an assessment of the nature and significance of the likely effects of the proposed development.

3.4.6 All work will be completed in accordance with the Institute of Field Archaeologists Standard and Guidance for Archaeological Desk-Based Assessments (2001).

4. Geology, Hydrology and Hydrogeology

4.1 Policy and Legislative Context

- 4.1.1 The Water Framework Directive (WFD) is a substantial piece of European water legislation, and is focused on delivering an integrated approach to the protection and sustainable use of the water environment on a river basin scale.
- 4.1.2 The Water Resources Act 1991 states that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters. The Act was revised by The Water Act (2003) which sets out regulatory controls for water abstraction, discharge to water bodies, water impoundment and protection of water resources.
- 4.1.3 The Groundwater Regulations 1998 require the prevention of List I substances entering groundwater and the control of List II substances to avoid pollution of groundwater. Within the context of the WFD, legislation will be enacted in due course to introduce the groundwater daughter directive which will seek to prevent deterioration in groundwater quality.
- 4.1.4 The Land Drainage Act 1991 (as amended) places responsibility for maintaining flows in watercourses on landowners. The Act gives local authorities powers to serve a notice on landowners to ensure works are carried out to maintain flow of watercourses.
- 4.1.5 Planning Policy Statement 25 (PPS25): Development and Flood Risk sets out Government policy on development and flood risk. Its aims are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, to direct development away from areas of highest risk and to prevent new development increasing flood risk.
- 4.1.6 Other relevant guidance includes:
- The Environment Act (1995);
 - The Environmental Protection Act (1990), which introduced the concept of integrated pollution control;
 - Environment Agency Pollution Prevention Guidance Notes (PPG); and
 - CIRIA Report C532: Control of Water Pollution from Construction Sites.

4.2 Baseline Overview

- 4.2.1 The application site is located between Winwick and Cold Ashby in Northamptonshire, with elevations between 143m Above Ordnance Datum (AOD) in the east rising to 180m AOD in the centre and west of the site. Currently the site comprises predominantly arable fields.
- 4.2.2 The site is located within the River Avon headwaters. A tributary of the Avon, the Claycoton Yelvertoft Beck, issues to the east of the site and flows through

it through a small pond, before flowing south. The beck confluences with the River Avon at Lilbourne, approximately 3km west of the site. An unnamed tributary also issues to the east of the northern end of the site and flows through it in a westerly direction before heading north west across the Cold Ashby Golf Course towards Elkington. A spring is present adjacent to Winwick Warren Farm. A second unnamed tributary issues on the eastern boundary of the Warren Covert woodland and flows along the southern site boundary and into the Claycoton Yelvertoft Beck. The Grand Union Canal lies approximately 1km west of the site.

4.2.3 In addition to the pond fed by Claycoton Yelvertoft Beck, there are two small offline ponds within the application site; the first is located alongside the eastern boundary of the site west of Crow Spinney woodland, and the second to the south of Claycoton Yelvertoft Beck in the centre of the site.

4.2.4 According to the Environment Agency website, the site lies entirely within Flood Zone 1, representing a low probability of flooding (less than 0.1% annual probability of flooding).

4.2.5 The Claycoton Yelvertoft Beck has not been assessed for water quality under the WFD. The River Avon is classified as 'Good' under the draft WFD River Basin Management Plan. The closest water quality sampling point is on the Grand Union Canal from North Kilworth to Crick. The 2007 results indicated the following water quality scores:

- Chemistry - Grade C: Fairly Good
- Biology – (no score available)
- Nitrates – Grade 3: Moderately Low
- Phosphates – Grade 1: Very Low

4.2.6 The solid geology beneath the site is mapped on the British Geological Society website at a scale of 1:625,000, classifying the geology as the Jurassic Lias sedimentary formation. Overlying the Lias are superficial Glacial Till deposits. The soils on the site are described as slightly acid loamy and clayey soils with impeded drainage, on the National Soils Research Institute website (<http://www.landis.org.uk/soilscapes/>).

4.2.7 There are no groundwater Source Protection Zones within the application site.

4.3 Proposed Scope of Assessment

4.3.1 Baseline data will be collated to identify hydrological receptors and to determine the sensitivity of the surface water and groundwater environment. Geological data will be used only to inform this process and provide contextual information for hydrology and hydrogeology. Direct and indirect effects on the identified hydrological and hydrogeological receptors from the wind farm development will be assessed.

4.3.2 Data on private water supplies will be requested from Daventry District Council. Due to the rural nature of the surrounding landscape, it is possible

that local properties, including Winwick Warren Farm, use small private supplies for domestic water. A separate Private Water Supplies Assessment may be required if the baseline assessment identifies sensitive local supplies.

4.4 Assessment Methodology (approach)

4.4.1 The hydrology and hydrogeology of the application site will be determined through a desk-based study to identify features of the surface water and groundwater environment and to determine the presence of sensitive receptors. Consultations with the Environment Agency, local authority and water companies will be carried out to obtain more local detailed information of the area. A method of evaluating the sensitivity of the receptors through the likely impacts from the development will also be produced. The data collation exercise will be supplemented by a site visit to develop a conceptual understanding of the site.

4.4.2 The assessment will be based on the inclusion of mitigation measures, which will be fed into the method statement for the development covering: the control of drainage runoff from excavations and access tracks; watercourse crossings; and the control of concrete pouring. These measures will reflect current best practice in the industry. Standard construction practices adopted on wind farm developments would be assessed, and modified, where necessary, to ensure that predicted impacts and effects could be controlled. Environment Agency and recent CIRIA guidance on the protection of the water environment will also be used to assist with the development of mitigation.

5. Terrestrial and Aquatic Ecology

5.1 Policy Context

5.1.1 The assessment will take account of the requirements of, and advice given in:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- The Countryside and Rights of Way Act (2000);
- The Natural Environment and Rural Communities Act (2006);
- The Protection of Badgers Act 1992;
- Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation, which sets out the UK Government's Policy for the conservation of natural heritage;
- The UK Biodiversity Action Plan; and
- The Northamptonshire Local Biodiversity Action Plan.

5.2 Baseline Overview

Designated Sites

- 5.2.1 It has been determined from MAGIC online that there are no statutorily designated sites within 5km of the application site boundary. The nearest is Stanford Park Site of Special Scientific Interest (SSSI) circa 6km to the northwest which is designated for its rich assemblage of lichens. There are 25 non-statutory sites within 5km, the nearest of which is Elkington Vale, 1.2km to the northwest.

Habitats

- 5.2.2 Consultants Baker Shepherd Gillespie (BSG) carried out an extended Phase 1 habitat survey in October 2008. The following information is taken from the report produced on this survey by BSG.
- 5.2.3 The site is predominantly comprised of arable fields with frequent hedgerows and occasional boundary drainage ditches. There are several small areas of plantation broadleaved woodland on and adjacent to the site. Warren Covert, an area of mature mixed woodland, lies adjacent to the southern boundary of the site. The Claycoton Yelvertoft Beck flows through the site and three ponds are located within the application site boundary with a further three within 150m of the site. There are a number of farm buildings on site, mainly associated with Winwick Warren Farm.
- 5.2.4 The arable fields have grassland margins of varying widths with patches of tall ruderal vegetation. Species present include false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata*, perennial rye-grass *Lolium perenne*, red fescue *Festuca rubra*, creeping thistle *Cirsium arvense*, creeping buttercup *Ranunculus repens*, broadleaved dock, *Rumex obtusifolius*, and great plantain *Plantago major*.
- 5.2.5 Hedgerows are mainly species poor hawthorn *Crataegus monogyna* with frequent blackthorn *Prunus spinosa* and elder *Sambucus nigra* and occasional mature ash *Fraxinus excelsior* and pedunculate oak *Quercus petraea*. A species rich hedgerow is located within the northern section of the site with field maple *Acer campestre*, elder, hawthorn, bramble *Rubus fruticosus*, ash, blackthorn, crab apple *Malus sylvestris* and bracken *Pteridium aquilinum*.
- 5.2.6 The wet ditches are generally less than one metre wide, with relatively steep vegetated banks. Marginal vegetation includes soft rush *Juncus effusus* and tufted hair-grass *Deschampsia cespitosa* and the banks are generally dominated by tall ruderal vegetation, including common nettle *Urtica dioica*, hedge woundwort *Stachys sylvatica* and hogweed *Heracleum sphondylium*.
- 5.2.7 The plantation broadleaved woodlands are variable but all have a presence of oak and ash in the canopy with occasional horse chestnut.
- 5.2.8 Warren Covert has a more or less continuous canopy of varying age comprising ash, horse chestnut *Aesculus hippocastanum*, silver birch *Betula pendula*, holly *Ilex aquifolium*, elder and hazel. The shrub layer is

discontinuous and mainly comprises regenerating trees. The ground flora is sparse and species poor and is mainly Yorkshire fog *Holcus lanatus*, common nettle, young bramble and isolated tussocks of tufted hair-grass. The stream on the southern edge of the woodland is between 0.5m and 2m wide with a sandy substrate and mainly exposed earth banks.

- 5.2.9 Pond A. This pond is located adjacent to an area of mature plantation broadleaved woodland, centred at OS grid reference SP 640 747. The pond is approximately 25m x 20m, and the water is turbid. Due to the size of the pond, it was not possible to determine the maximum water depth or depth of silt. The banks are steep and densely vegetated with tall ruderal vegetation including common nettle, cock's-foot, false oat-grass and willowherb *Epilobium sp.* Marginal vegetation is generally absent, restricted to a patch of hard rush *Juncus inflexus* and brooklime *Veronica beccabunga* on the eastern pond margin. Approximately 50% of the shore of Pond A is shaded by the adjacent woodland. Arable fields surround the pond in the wider area. Pond B is located approximately 110m to the east of Pond A, linked via a species-poor hedgerow with trees.
- 5.2.10 Pond B. This pond is located within an area of scrubby broadleaved woodland, centred at OS grid reference SP 641 747. The pond is approximately 5m x 5m. The pond is shallow, with a maximum depth of approximately 50cm, and with shallowly sloping banks. There is no marginal vegetation present. The pond is completely shaded by the surrounding woodland. Arable fields surround the pond in the wider area. Pond A is located approximately 110m to the west of Pond B, linked via a species-poor hedgerow with trees.
- 5.2.11 Pond C. This pond is located at the base of a species-poor hedgerow, within a small stand of scrubby willow carr, in the corner of two arable fields, centred at OS grid reference SP 639 742. The pond is limited to an area of damp ground, with only occasional shallow pools of standing water. A wet ditch is located along the northern limit of the pond. The pond's marginal vegetation includes soft rush, brooklime, horsetail *Equisetum sp.*, Yorkshire fog, common nettle and creeping buttercup with occasional mosses. An improved grassland field is located to the east of the pond, with arable fields situated to the north, south and west. A species-poor hedgerow and wet ditch extend from the pond to the east and the west.
- 5.2.12 Pond D. This pond is located adjacent to the western site boundary within an improved grassland field, centred at OS grid reference SP 634 745. The pond is approximately 10m x 10m, limited to an area of damp ground with no open water present at the time of survey. Floating sweet-grass *Glyceria fluitans* and soft rush now cover the surface of the pond. The banks of the pond are gently sloping, and grade into the surrounding improved grassland habitat, with no distinct bankside vegetation present.
- 5.2.13 Pond E. This pond is located to the west of the site boundary, at the corner of two improved grassland fields, centred at OS grid reference SP 632 738. The pond is approximately 13m x 8m, and the water is relatively clear, with a maximum depth of approximately 1m at the time of survey. The eastern,

southern and western banks are steep, and the northern bank is gently sloping. The marginal vegetation is limited to the northern pond margin, where brooklime, willowherb and forget-me-not *Myosotis sp.* are present. The pond is overhung by hawthorn and ash, which shade approximately 90% of the shores. Species-poor hedgerows with trees are present to the south and west of the pond.

- 5.2.14 Pond F. This pond is located adjacent to the eastern boundary of Winwick Covert, at the base of a steep slope within an improved grassland field, centred at OS grid reference SP 643 739. The pond is approximately 3m x 5m. The entire pond surface was covered with common duckweed *Lemna minor* and least duckweed *Lemna minuta* at the time of survey, therefore it was not possible to estimate the maximum water depth of the pond, or depth of silt. The banks are steep and vegetated with species from the adjoining improved grassland field, including perennial rye-grass and cock's-foot. Brooklime is present at the margins of the pond. Approximately 60% of the shore of Pond F is shaded by a mature ash tree located on the eastern bank top, and by overhanging holly and ash on the western bank.

Protected Species

- 5.2.15 Records of species that are afforded legal protection¹² or are otherwise of nature conservation importance (e.g. rare species) were obtained through consultation with Northamptonshire Biodiversity Records Centre (NBRC).

Table 5.1 Protected Species Records

Species	Date of Record	Location	OS Grid Ref	Distance from site
Badger <i>Meles meles</i>	1979	Yelvertoft		2.6km to the west
Badger	1994	Cottesbrooke		4.3km to the east
Badger	1995	Old Hemplow		3.5km to the northwest
Badger	1996			4.6km to the southeast
Badger	1996			3.6km to the southeast
Badger	1996			4.0km to the southeast
Badger	1996			1.5km to the east

¹² Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to species included on: Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended), excluding species that are only protected in relation to their sale (see Section 9[5] and 13[2]) reflecting the fact that the proposed development does not include any proposals relating to the sale of species; Schedules 2 and 4 of The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (SI 1994 No. 2716); and badgers, which are protected under the Protection of Badgers Act 1992.

Species	Date of Record	Location	OS Grid Ref	Distance from site
Badger	2005	Between East and West Haddon		3.0km to the south
Badger	1997	A50		1.6km to the northeast
Badger	2007			4.2km to the northwest
Badger	2007	Grand Union Canal		1.2km to the west
Badger	2008	Road near West Haddon		1.6km to the east
Great crested newt <i>Triturus cristatus</i>	1979	Thornby Hall	SP 67 75	3.0km to the east
Great crested newt	1980	Thornby Hall	SP 67 75	3.0km to the east
Great crested newt	1985	West St, Welford	SP 64 80	3.5km to the east at the nearest
Great crested newt	2007	Pond in Bury Dyke, Crick	SP 59020 72548	4.3km to the southwest
Great crested newt	1985	West St, Welford	SP 64 80	3.5km to the north at the nearest
Water vole <i>Arvicola terrestris</i>	1996	Grand Union Canal: Yelvertoft	SP 60400 75000	3.0km to the west
Water vole	1997	Grand Union Canal: Crick	SP 59600 72599	4.0km to the southwest
Water vole	1984	Grand Union Canal	SP 60 79	4.6km to the northwest at the nearest
Water vole	1984	Stanford Reservoir	SP 60 79	4.6km to the northwest at the nearest
Water vole	1990		SP 599 742	3.4km to the west
Water vole	1990		SP 599 742	3.4km to the west
Water vole	1998		SP 599 742	3.4km to the west
Daubenton's bat <i>Myotis daubentoni</i>	1996		SP 68 70	4.9km to the southeast at the nearest
Whiskered bat <i>Myotis mystacinus</i>	1996		SP 68 70	4.9km to the southeast at the nearest
Common pipistrelle <i>Pipistrellus pipistrellus</i>	1996		SP 68 70	4.9km to the southeast at the nearest
Common pipistrelle <i>Pipistrellus pipistrellus</i>	2005		SP 646 709	2.9km to the south
Brown long-eared bat <i>Plecotus auritus</i>	1996		SP 68 70	4.9km to the southeast at the nearest
White-clawed crayfish <i>Austropotamobius pallipes</i>	1991		SP 64499 80800	4.3km to the north
White-clawed crayfish <i>Austropotamobius pallipes</i>	1991		SP 64499 80800	4.3km to the north

Species	Date of Record	Location	OS Grid Ref	Distance from site
White-clawed crayfish <i>Austropotamobius pallipes</i>	1992		SP 64499 80800	4.3km to the north
Common dormouse <i>Muscardinus avellanarius</i>	1994	Cottesbrooke	SP 689 746	4.3km to the east
Common toad <i>Bufo bufo</i>	2006		SP 6625 7479	1.7km to the east
Grass snake <i>Natrix natrix</i>	1958		SP 66 77	1.2km to the east at the nearest
Brown hare <i>Lepus capensis</i>	1996		SP 64 74	Potentially within the site
Polecat <i>Mustela putorius</i>	2003		SP 606 726	3.1km to the southwest

5.3 Proposed Scope of Assessment

5.3.1 In assessing the effects of any development on terrestrial and aquatic ecology it is necessary to define the areas of land cover and the species and habitats that need to be considered. In doing this, two inter-related factors need to be considered:

- A development can affect habitats and species directly (e.g. the land-take required) and indirectly (e.g. disturbance), with the impacts potentially extending beyond the boundaries of the application site;
- It is impractical for an ecological assessment to consider every individual species and habitat that may potentially be affected, rather it should focus on valued ecological receptors (i.e. species and habitats that are valued in some way, for example, designated sites, species protected by specific legislation or species which have economic value) and which could potentially be affected by the proposed development.

5.3.2 It is against this background that the scope of this assessment has been defined through preliminary desk study and an extended Phase 1 habitat survey following standard methodology.¹³

Designated Sites

5.3.3 Given the distance between the application site and the nearest designated sites it is unlikely that there would be any significant effects on them and therefore it is proposed to scope these sites out of further assessment.

¹³ Joint Nature Conservation Committee (JNCC) (2007) Handbook for Phase 1 Habitat Survey. JNCC, Peterborough.

Habitats

- 5.3.4 The assessment will be based on the Phase I habitat survey that has already been undertaken. Habitats present within the site are of very limited value to nature conservation and on this basis no further habitat surveys are considered necessary at this stage.

Protected Species

- 5.3.5 The assessment will be based on the Phase 1 habitat survey and additional protected species surveys that will be undertaken during the appropriate survey season. As a result of the extended Phase 1 habitat survey and desk study, the requirement for protected species surveys for great crested newt¹⁴, water vole¹⁵, bats¹⁶ and badger¹⁷ has been identified. All other protected species have been scoped out of requiring further detailed surveys.
- 5.3.6 Great crested newts. There are records of great crested newts in the vicinity of the site and four of the ponds on and surrounding the site (ponds A, C, E and F) were considered by BSG to have potential to support this species. Therefore it is proposed to carry out great crested newt surveys of these ponds. A minimum of four surveys will be carried out during the period mid-March to mid-June in accordance with best practice guidelines¹⁸. A further four ponds have been identified from OS maps and aerial photographs within 500m of the site but to date access has not been possible to these ponds to assess whether or not they have potential for great crested newts.
- 5.3.7 Badger. There are records of badger activity within the application site boundary and the woodland, improved pasture and arable fields provide suitable foraging grounds. The woodland areas also offer suitable habitat for sett construction. Therefore targeted badger surveys will be conducted within suitable habitat, searching for badger setts that may be affected by the wind farm development.
- 5.3.8 Water vole. Suitable habitat exists on site for this species and historical records exist nearby. It is therefore proposed to conduct surveys for this species within 50m of working areas.
- 5.3.9 Bats. There are no confirmed bat roosts on site but there is potential in some of the mature trees on site. In addition the hedgerows, ponds and woodland edges provide suitable foraging habitat and there are records of bats in the

¹⁴ Great crested newts are fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

¹⁵ Water voles are fully protected under the Wildlife and Countryside Act 1981 (as amended).

¹⁶ All species of British bats are fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

¹⁷ Badgers are protected under the Protection of Badgers Act 1992, though on animal welfare grounds rather than conservation grounds.

¹⁸ English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

surrounding area. It is proposed to undertake a series of bat activity surveys by walking transects across the site and recording and analysing bat activity in line with best practice guidelines¹⁹. Recent Natural England draft guidance²⁰ recommends survey effort should be focussed on those periods when the highest concentrations of bats are likely (i.e. April to October in most situations). The guidance is not prescriptive in terms of survey effort required and advocates a pragmatic risk-informed basis for determining survey effort based on whether the site is likely to fall into a low or high risk situation for bats. Given the habitats on site and the potential for roosts an appropriate level of survey effort is likely to be once per month during April to October using a combination of walked transect surveys and anabat detectors. In addition, a further assessment will be made of the trees (not buildings) for roosting potential which would be followed up, if necessary, with emergence and/or swarming surveys following best practice guidelines.¹⁸

5.4 Assessment Methodology (approach)

5.4.1 The assessment will focus on assessing the potential impact of the Winwick Warren Wind Farm on those species and habitats of nature conservation value that have been identified within the site or adjacent to its boundary.

5.4.2 The Ecological Impact Assessment will take account of Institute for Ecology and Environmental Management (IEEM) guidelines for Ecological Impact Assessment.²¹

6. Ornithology

6.1 Policy Context

6.1.1 The assessment will take account of the requirements of, and advice given in:

- Council Directive 79/409/EEC on the Conservation of Wild Birds;
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- The Countryside and Rights of Way Act (2000);
- The Natural Environment and Rural Communities Act (2006);

¹⁹ Bat Conservation Trust (BCT) (2007) Bat Surveys – Good Practice Guidelines. BCT, London.

²⁰ Natural England (2008) Bats and Onshore Wind Turbines: Interim Guidance. Natural England, Peterborough.

²¹ IEEM (2006). Guidelines for Ecological Impact Assessment in the United Kingdom. IEEM, Winchester.

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- Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation, which sets out the UK Government's Policy for the conservation of natural heritage;
 - IEEM guidelines on ecological impact assessment (IEEM, 2006);
 - Assessing Significance of Impact from Onshore Windfarms Outwith Designated Areas (2006) – Scottish Natural Heritage guidance;
 - Survey Methods for use in Assessing the Impacts of Onshore Windfarms on Bird Communities (2005) - Scottish Natural Heritage guidance;
 - The UK Biodiversity Action Plan; and
 - The Northamptonshire Local Biodiversity Action Plan.

6.2 Baseline Overview

- 6.2.1 Statutorily and non-statutorily designated sites of nature conservation interest within 5km of the application site have been determined. In addition, Special Protection Areas (SPAs) within 20km of the site have been identified as the highly mobile nature of some bird species (e.g. wintering waterfowl) could bring them into contact with Winwick Warren.
- 6.2.2 As stated in the ecology section above, there are no statutorily designated sites within 5km of the site. There are no SPAs within 20km but the Upper Nene Valley Gravel Pits proposed Special Protection Area (pSPA) is just over 20km to the south east of the site. This site is of national importance for wintering waterbirds and its assemblage of wetland breeding birds.
- 6.2.3 Desk records obtained from the Northamptonshire Biological Records Centre (NBRC) for the site and surrounding 5km comprised a range of common and widespread (albeit declining in some cases) species typical of lowland farmland including grey partridge *Perdix perdix*, lapwing *Vanellus vanellus*, curlew *Numenius arquata*, skylark *Alauda arvensis*, yellow wagtail *Motacilla flava* and tree sparrow *Passer montanus*.

6.3 Proposed Scope of Assessment

- 6.3.1 In assessing the effects of any development on ornithological interest it is necessary to identify the species that both use the site (e.g. for foraging or nesting) and those that move across it. When doing this it is important to consider the impacts that wind farms can have on birds, namely:
- The effects of direct habitat loss due to land take by wind turbine foundations, tracks and ancillary structures;
 - Indirect habitat loss (i.e. the displacement of birds due to the proximity of the wind turbines). Such displacement may occur as a consequence of disturbance associated with construction work, or due to deterrence effects arising from the presence of turbines close to nest or feeding sites or on habitual flight routes; and

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- The effects of collision with rotating turbine blades, overhead wires, guy lines and fencing (i.e. killing or injury of birds), which is of particular relevance for sites located in areas known to support raptors or large concentrations of waterfowl.

6.3.2 It is against this background that the scope of this assessment has been defined through preliminary desk study, professional judgement and guidance produced by Scottish Natural Heritage (SNH). The assessment will be based on the following surveys that are being undertaken or will be undertaken during the appropriate survey season.

Vantage Point Watches

6.3.3 Vantage point watches are used to identify the target species that are present in the area of the proposed wind farm and to understand how they use the airspace above the site. The information collected is used to aid the design of the wind farm, to give an understanding of the level of use of the site by birds and to inform the assessment of collision risk.

6.3.4 At Winwick Warren 36 hours of vantage point watches from each vantage point are being undertaken this winter and a further 36 will be undertaken over the summer. Watches are being carried out from two vantage points: VP1 SP 630 743 and VP2 SP 643 743.

6.3.5 The watches are being undertaken following the methods laid out in the SNH survey guidance. Vantage point watches are used to identify the target species that are present in the area of the proposed wind farm and to understand how they use the airspace above the site. The information collected is used to aid the design of the wind farm, to give an understanding of the level of use of the site by birds and to inform the assessment of collision risk.

Winter Field Counts

6.3.6 Walkover surveys have been undertaken on site in the vicinity of the proposed turbine locations on two occasions over the winter to provide additional information on foraging/loafing birds using the site.

Common Bird Census

6.3.7 A version of the Common Bird Census methodology (described in SNH guidance) will be used to map the territories of breeding birds on site in the vicinity of the proposed turbine locations. This method is that commonly used for territory mapping surveys within farmland habitats and as such should provide a representative picture of the bird community present. This data will be used to characterise the breeding bird community of the site and to assess the potential impacts of disturbance.

6.4 Assessment Methodology (approach)

- 6.4.1 The assessment will focus on the potential impact of the Winwick Warren Wind Farm on those species that are of high nature conservation value and are thought to be vulnerable to this type of development.
- 6.4.2 The assessment methodology used will be based upon that developed by SNH and the British Wind Energy Association (BWEA) (Percival *et al.* 1999) and subsequently expanded on by SNH (2006) and Percival (2007). The IEEM guidelines for Ecological Impact Assessment will also be considered during the assessment process.

7. Socio-economics and Public Attitude

7.1 Policy Context

- 7.1.1 The key planning policy with regard to renewable energy development is Planning Policy Statement 22 (PPS22): Renewable Energy and the accompanying Companion Guide.

7.2 Baseline Overview

- 7.2.1 The Winwick Warren site is situated in relative isolation in an area of low population density with the closest villages being Cold Ashby just north east of the site boundary, and Winwick approximately 1.5km to the south west. There are two residential dwellings within the application site; Winwick Warren located in the southern part of the site and Lichfield Farm found within the northern part of the site (**Figure 1**). Other surrounding dwellings tend to be interspersed farmhouses. Cold Ashby Golf Course lies adjacent to the western boundary of the application site. The Cold Ashby Golf Club House is located around 0.2km from the application site boundary. The site is situated within the jurisdiction of Daventry District Council.

7.3 Proposed Scope of Assessment

- 7.3.1 The assessment will examine through a desk based assessment:
- Benefits in relation the alleviation of climate change; the contribution of renewable energy that provides a net supply of power to the electricity distribution system is considered beneficial;
 - Generation of employment opportunities; and
 - Direct/indirect effects on economic activity in the surrounding area, for example, as a result of construction workers using local Bed and Breakfast accommodation and shopping locally.
- 7.3.2 Effects on local residents and land use due to visual impact, shadow flicker and noise are reported on in other technical assessments.

7.4 Assessment Methodology (approach)

7.4.1 There is no prescribed methodology or standard guidance of relevance to this assessment. The method adopted will draw on publicly available information and the outcome of consultations to determine the existing socio-economic circumstances. The effects of the wind farm development on this baseline situation will then be assessed using knowledge gained from previous wind farm developments and professional judgement.

8. Public Access, Safety and Shadow Flicker

8.1 Policy Context

8.1.1 The key planning policy with regard to renewable energy development is PPS22: Renewable Energy and the accompanying Companion Guide. The latter contains a discussion on public safety in terms of accident or injury being caused by proximity to wind turbines and the occurrence of the shadow flicker effect.

8.2 Baseline Overview

8.2.1 There is one Byway Open to All Traffic that crosses the application site (ID: FM008). The byway runs in a south westerly direction across the site from the Cold Ashby Parish boundary south of the Cold Ashby Golf Club House (situated within the Cold Ashby Golf Course) to join the unclassified road (Elkington Road) north of Winwick village.

8.2.2 The Jurassic Way footpath and bridleway (ID: EP4) is located less than 1km to the west of the application site boundary. The Jurassic Way is a Northamptonshire county path running from Banbury to Stamford.

8.2.3 The Winwick Warren site is situated in relative isolation in an area of low population density, but there are a number of properties which could be affected by shadow flicker effects, including Winwick Warren and Lichfield Farm, both of which are situated within the application site. Cold Ashby village also lies just north east of the site boundary. PPS22 details how, under certain combinations of geographical position, time of day and year, the sun may pass behind a turbine rotor and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off; the effect is known as shadow flicker. It occurs only within buildings where the flicker appears through a narrow window opening.

8.3 Proposed Scope of Assessment

8.3.1 The assessment will examine through a desk based assessment:

- Direct effects on recreational access with particular reference to Public Rights of Way and their use by walkers and horse riders in terms of proximity to the proposed installation in accordance with PPS22, effects due to visual impact and noise will be dealt with in other technical assessments; and

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- Shadow flicker assessment for properties situated within a 130 degree segment either side of due north, relative to the turbines and within ten times turbine rotor diameter in accordance with the PPS22 Companion Guide.

8.4 Assessment Methodology (approach)

8.4.1 An assessment of public access and safety issues will be undertaken. This will include consultation with relevant consultees, the iterative turbine layout design process, and the implementation, where necessary, of operational control measures.

8.4.2 In order to quantify the shadow flicker effect, it is possible to calculate the number of hours per year that shadow flicker may occur at a dwelling from the relative position of the turbine to the dwelling, the geometry of the wind turbine and the latitude of the potential site. The assessment will be undertaken in accordance with the guidance set out in the PPS22 Companion Guide. Mitigation measures will be implemented as necessary.

9. Transport

9.1 Policy Context

National Policy

9.1.1 Advice on transportation is provided within the 2001 former Office of the Deputy Prime Minister (ODPM) publication Planning Policy Guidance 13 (PPG13): Transport. The objectives of PPG13 are to integrate planning and transport at the national, regional, strategic and local level and to promote more sustainable transport choices both for carrying people and moving freight. PPG13 acts as a guide for regional and local planning authorities in the production of their spatial strategies and development rules.

Regional Policy

9.1.2 Policies are contained within the Regional Transport Strategy (RTS) prepared by the East Midlands Regional Assembly. In line with Government policy the objectives of the RTS are to integrate land-use planning and transport planning, steer new development into sustainable locations, reduce the need to travel and enable journeys to be made by more sustainable modes of transport.

Local Plan Policies

9.1.3 Local policies are contained within Northamptonshire's Local Transport Plan (LTP) 2006-2011, published March 2006.

9.1.4 Northamptonshire County Council (NCC) has identified the importance of efficient freight movements to the county's economy which enforces the

importance of a quality core road network. The LTP recognises the need to prevent the use of minor rural roads as part of a longer journey.

9.1.5 *“If we consider the areas surrounded by A roads as cells or zones, we need to prevent lorries travelling through cells and to travel around them using the appropriate lorry routes which will have the following benefits:*

- *Reduce the impact of goods vehicles on local communities;*
- *Prolong the life of the secondary road network;*
- *Prevent diversion of traffic from the strategic network due to congestion;*
- *Counteract the increasing reliance of lorry operators on computer routing software which, in its less sophisticated forms, simply chooses the shortest route between two points;*
- *Pre-empt the effects of construction traffic arising from new development; and*
- *Respond to a growing attitude among drivers and operators that they can use any road as long as it does not have a legal restriction”.*

9.1.6 The LTP has identified four levels of control that can be put in place. These are:

- 1) Lorry Barrier e.g. point weight limit or width of height barrier;
- 2) Blanket Weight Limit;
- 3) Restricted core(s) of zone protecting sensitive areas; and
- 4) Signing only backed by publicity.

9.2 Baseline Overview

9.2.1 The application site is located in north Northamptonshire, approximately 6km east of Junction 18 of the M1 and 2km south of the A14. The site is situated between the settlements of Winwick to the southwest and Cold Ashby to the north.

9.2.2 The site will most likely be linked to the highway network by an access track from the B4036, north of Winwick Warren Farm (subject to confirmation).

9.2.3 The B4036 is a single lane, two-way carriageway which runs between West Haddon and Market Harborough.

9.2.4 There are no pedestrian footways and few development frontages along the B4036 in the vicinity of the application site. Between West Haddon and Cold Ashby the road is predominantly bounded by grass verges.

9.2.5 The exact haulage routes for construction traffic are yet to be confirmed. However, a material sourcing exercise has identified potential routing for all construction traffic (including abnormal loads carrying turbine equipment). The following data sources were used to inform the exercise:

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- The Quality Scheme for Ready Mixed Concrete (QSRMC) available at <http://www.qsmc.co.uk/index2.php> was used to identify the nearest concrete supplier to the site.
 - Yell. Available at: <http://www.yell.com/ucs/HomePageAction.do> was used to identify the nearest quarry to the site.

9.2.6 Based on the results of this exercise it is assumed that construction traffic will route from the north or south on the M1 before leaving the motorway at Junction 18 and routing on the A428. Traffic is then assumed to route east on the A428 which bypasses the settlements of Crick and West Haddon. At West Haddon construction traffic will route northeast on the B4036 for approximately 2.5km before entering the application site.

9.2.7 Appropriate baseline data will be obtained once the site access has been confirmed.

9.3 Proposed Scope of Assessment

9.3.1 The main transportation impacts will be associated with the movement of commercial heavy goods vehicles (HGVs) travelling to and from the Winwick Warren Wind Farm during the construction phase of the development. The potential routing of construction traffic to and from the site has been described in the previous section.

9.3.2 Once the wind farm is operational, it is envisaged that the amount of traffic associated with the scheme would be minimal. Occasional visits may be made to the site for maintenance checks. The vehicles used for these visits are likely to be a Land Rover or similar and there may be an occasional need for a HGV to access the site for maintenance and repairs. It is considered that the effects of operational traffic would be negligible and therefore no detailed assessment of the operational phase of the development is proposed.

9.3.3 The 2007 Department for the Communities and Local Government (DCLG) / Department for Transport (DfT) publication Guidance on Transport Assessment refers to Circular 02/99: Environmental Impact Assessment (Circular 02/99) published by the Department of the Environment, Transport and the Regions (DETR), for details on environmental assessment. However, Circular 02/99 does not provide specific guidance on the approach to traffic and transport related assessment.

9.3.4 The only document available which sets out a methodology for assessing potentially significant environmental impacts is the 1993 Institute of Environmental Assessment (IEA) publication Guidance Notes No. 1: Guidelines for the Environmental Assessment of Road Traffic.

9.3.5 In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on local roads and the users of those roads; and

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- Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting those roads, including the relevant occupiers and users.
- 9.3.6 The guidance identifies the following as potential environmental effects affected by changes in traffic flows as a result of the development:
- Severance;
 - Driver delay;
 - Pedestrian delay;
 - Pedestrian amenity;
 - Fear and intimidation; and
 - Accidents and safety.
- 9.3.7 Should the percentage impact exercise determine that the thresholds will not be exceeded; no further consideration will be given to potential effects.

9.4 Assessment Methodology (approach)

- 9.4.1 The following rules taken from the guidance would be used as a screening process to define the scale and extent of the assessment:
- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%).
 - Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.
- 9.4.2 Increases below 10% are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level are therefore assumed to result in no discernible environmental impact.
- 9.4.3 Estimates of traffic generation associated with the construction phase of the development will be based on information provided by E.ON Climate and Renewables (EC&R) and knowledge gained from similar studies of HGV load capacities.
- 9.4.4 The estimated traffic generation of the wind farm development will be compared with baseline traffic flows in order to determine the percentage increase in traffic on each receptor. The environmental effects which could be considered as potentially significant will then be assessed where the threshold is exceeded.

10. Noise

10.1 Policy Context

- 10.1.1 The Regional Spatial Strategy (RSS) for the East Midlands recommends that Local Authorities should consider the effects on the built environment, including noise intrusion, from renewable energy developments when establishing criteria for their assessment.
- 10.1.2 Daventry District Council planning policy documents do not specifically refer to noise emissions from wind energy developments.
- 10.1.3 Planning Policy Statement 22 (PPS22): Renewable Energy gives guidance over the technical assessment of renewable energy. The methodology for the assessment of operational noise from wind farms in England recommended by PPS22 is that documented within ETSU-R-97: *The Assessment and Rating of Noise from Wind Farms* (ETSU 1996).

10.2 Baseline Overview

- 10.2.1 Background noise monitoring has not yet been undertaken. It is anticipated that background noise levels would be typical of those in a rural area, influenced by distant road traffic and anthropogenic noise sources closer to areas of habitation.
- 10.2.2 Noise monitoring is proposed at six properties surrounding the windfarm site:
- One in Winwick;
 - One at Winwick Warren;
 - Two properties to the north of the site, along Cold Ashby Road;
 - A property to the west at Winwick Lodge and;
 - One to the east of the site around Thornby Grange.
- 10.2.3 The exact choice of location will be agreed with the local Environmental Health Officer and will also depend upon arranging access to the properties. Other receptors will be considered within the assessment, with the background noise levels being taken from their closest appropriate measurement position.

10.3 Proposed Scope of Assessment

- 10.3.1 It is proposed to consider construction noise from the development, including construction traffic noise for roads where sufficient data are available.
- 10.3.2 Operational noise from the site will also be considered following the ETSU-R-97 methodology.
- 10.3.3 Due to the low level of vehicle movements involved, it is proposed to scope out operational traffic noise.

10.4 Assessment Methodology (approach)

Construction Noise Evaluation

- 10.4.1 The assessment methodology will follow guidance outlined in BS5228: Noise and Vibration Control on Construction and Open Sites (2009).
- 10.4.2 It is expected that the overall duration of the construction stage for the proposed wind farm would last between 12 - 24 months. In most cases, construction noise is controlled through the implementation of mitigation measures (such as limiting hours during which construction can be undertaken) and undertaking construction works in accordance with good practices as described in BS5228 (such as using well maintained and serviced plant, and the appointment of a site contact to whom complaints / queries can be directed). Notwithstanding these measures, construction noise may be perceptible at the closest residential receptors. In order to undertake construction noise calculations, details of the construction programme, phasing of the works and types and numbers of plant are required. Such data would only become available once the contract(s) to construct the wind farm have been finalised. Notwithstanding the above, a worst-case scenario for construction noise assessment will be presented in the EIA.
- 10.4.3 It is not expected that construction noise would constitute a nuisance at the nearest receptors given the separation distances from the turbines to the nearest receptors. It is unlikely that construction noise will breach guidance levels set out in BS5228:2009 and is unlikely to present a significant impact.
- 10.4.4 An assessment of construction traffic noise would also be presented, using the Department of Transport publication Calculation of Road Traffic Noise (1988), where appropriate.

Operational Noise Evaluation

- 10.4.5 The assessment of wind farm noise is usually undertaken in two distinct phases. Initially the noise levels (in terms of $LA_{90, 10min}$) resulting from the operation of the wind farm (at a windspeed of 10m/s measured at 10m height) experienced at the closest residential receptors is predicted using noise propagation software. If these predictions show that noise levels experienced at the closest receptor are below $LA_{90, 10min}$ 35dB, there is no requirement to take the noise assessment further, with the low levels providing adequate mitigation. However, if the initial modelling shows that operational noise levels at the closest sensitive receptors are likely to be greater than $LA_{90, 10min}$ 35dB then a full assessment according to ETSU-R-97 guidelines should be carried out.
- 10.4.6 The aim of a full ETSU-R-97 assessment is to identify suitable noise limits for the wind farm so that the impact of operational noise at receptors is not significant. In order to achieve this, an understanding of the change in background noise levels with wind speed at receptors is required. This is achieved by monitoring background noise levels at the receptors, and simultaneously measuring the variation in wind speed and direction at the

wind farm site. These measurements are taken as a series of simultaneous ten-minute averaged measurements, over a period of at least two weeks. From these data, regression analysis is performed to determine typical background noise levels for each receptor across a range of wind speeds.

10.4.7 Noise limits are defined separately for daytime and night time. During quiet daytime periods (18:00 - 23:00 weekdays, 13:00 - 23:00 Saturdays and 07:00 - 23:00 Sundays), noise limits are as follows:

- 5dB above the background noise curve for wind speeds up to 12m/s, as described above;
- Where background noise levels are below 30-35dB LA_{90,10min}, the lower limit should be fixed at 35-40dB; and
- For properties with a financial interest in the scheme, the lower limit is fixed at 45dB.

10.4.8 For night-time periods (23:00 – 07:00 every day), noise limits are as follows:

- 5dB above the background noise curve for wind speeds up to 12m/s, as described above;
- The lower limit is fixed at 43dB; and
- For properties with a financial interest in the scheme, the lower limit is fixed at 45dB.

11. Infrastructure, Telecommunications, Utilities, and Air Safeguarding Issues

11.1 Policy Context

11.1.1 The key planning policy with regard to infrastructure, utilities, radar, and telecommunications is Planning Policy Statement 22 (PPS 22): Renewable Energy and the accompanying Companion Guide.

11.2 Baseline Overview

11.2.1 Several telecommunication links have been identified in the locality of the Winwick Warren site, two of which cross the application site.

11.2.2 Coventry Airport is located 25km to the west of the site.

11.2.3 Several active aeronautical sites have been identified in the area surrounding the site, the nearest of which is Husband's Bosworth Airfield in Lutterworth, located approximately 8km north. This airfield is currently used for gliding.

11.2.4 In addition, five other active aeronautical sites have been identified within 20km; at Swinford (around 9.5km north west), Pitsford (around 13.5km south east), Bruntingthorpe (around 14km north west), Sywell (around 18km south west) and Charwelton, south west of Daventry (around 20km south west).

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- 11.2.5 Sywell aerodrome is the largest aeronautical site in Northamptonshire and is considered to be one of the best general aviation airfields in the UK. The other airstrips at Swinford, Pitsford, Bruntingthorpe and Charwelton are private strips.
 - 11.2.6 The East Midlands Air Support Unit, the Northamptonshire / Leicestershire / Warwickshire Police helicopter is based south of Husbands Bosworth (located around 10km north east of the site).

11.3 Proposed Scope of Assessment

11.3.1 There is potential for wind turbines to affect electromagnetic transmissions by two methods: the blocking of or deflecting of line of sight transmissions (as with any large structure), or by the scattering of signals. Effects may, for example include disruption of microwave rebroadcast links or local radio communication systems. The quality of television reception may be affected, and viewers may suffer loss of picture quality and acoustic interference. Turbines can also appear as returns on radar systems and potentially interfere with communication networks. Wind turbines can also present an en-route obstruction to low flying aircraft, potentially affecting airspace operations.

11.4 Assessment Methodology (approach)

11.4.1 The infrastructure, telecommunications, television and aviation safety assessment will be largely based upon consultation with a number of organisations known to have an interest in electromagnetic interference, telecommunications and existing infrastructure (e.g. utilities) issues following the process described in the PPS22 Companion Guide. The assessment of significance is based on whether potential effects are fully avoided by the incorporated mitigation measures.

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