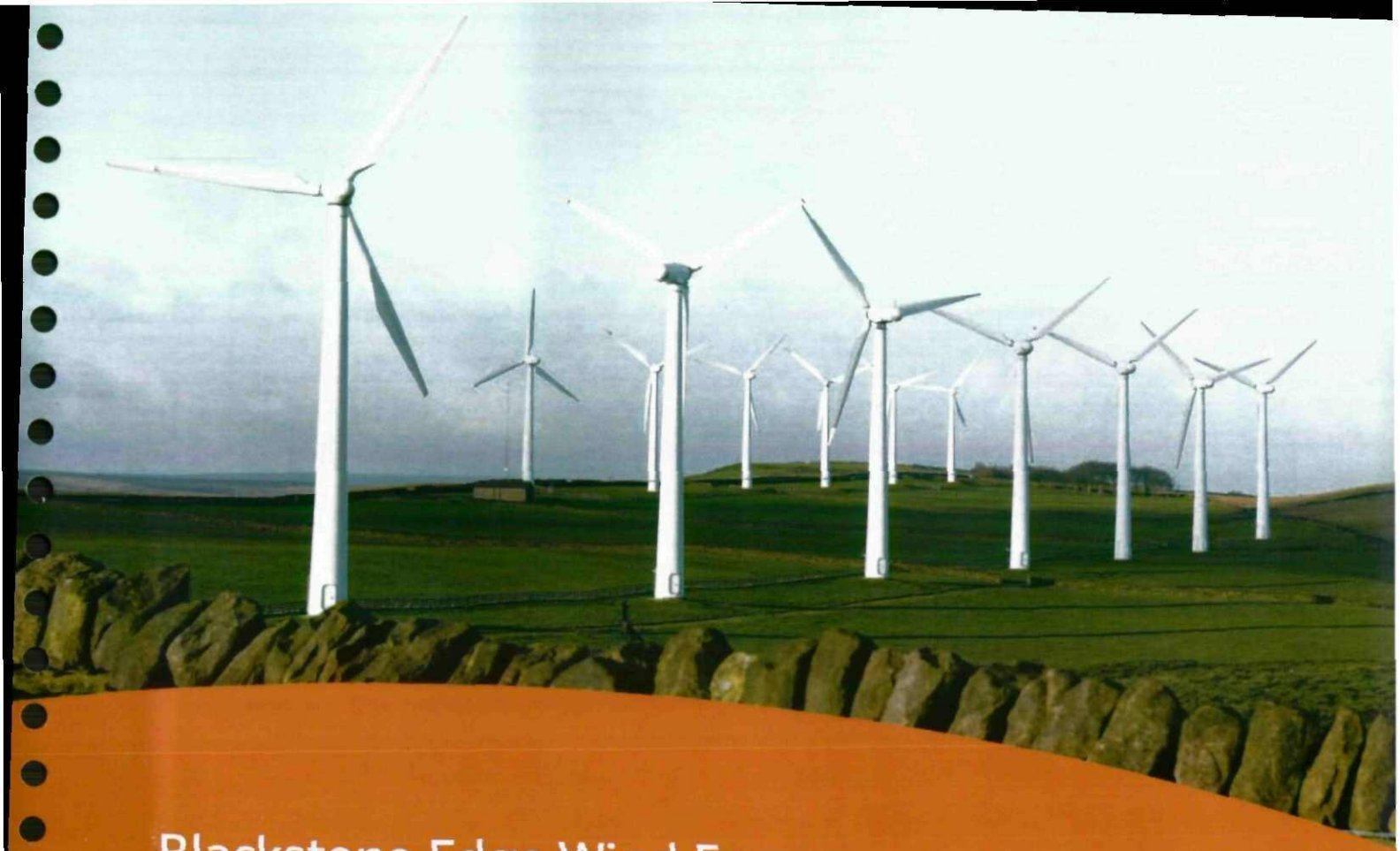


Blackstone Edge Wind Farm

Design and Access Statement

January 2008

e·on

E.ON UK plc

Blackstone Edge Wind Farm

Design and Access Statement

January 2008

Entec UK Limited

E.ON UK plc

Blackstone Edge Wind Farm

Design and Access Statement

January 2008

Entec UK Limited

Report for

Toby Lee
Project Developer
E.ON UK plc
Westwood Way
Westwood Business Park
Coventry
CV4 8LG

Main Contributors

Olly Buck
Angela Jones
Clare Horner

[redacted]

Olly Buck

Approved by

[redacted]

Paul Reaston

Entec UK Limited

17 Angel Gate
City Road
London
EC1V 2SH
England
Tel: +44 (0) 207 843 1400
Fax: +44 (0) 207 843 1410

h:\projects\ea-210\19000-projects\19569 - blackstone edge\reporting\es\final es\folder for printers\design and access statement\final design and access statement.doc

Certificate No. EMS 69090

Certificate No. FS 13881

In accordance with an environmentally responsible approach, this document is printed on recycled paper produced from 100% post-consumer waste, or on ECF (elemental chlorine free) paper

Copyright and Non-Disclosure Notice

The contents and layout of this report are subject to copyright owned by Entec (© Entec UK Limited 2008) save to the extent that copyright has been legally assigned by us to another party or is used by Entec under licence. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report.

The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Entec. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third Party Disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Entec at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Entec excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Document Revisions

No.	Details	Date

Contents

1. Design and Access Statement 1

1.1 Introduction 1
1.2 Methodology 1

2. Site Selection 3

2.1 Wind Power 3
2.2 Blackstone Edge Wind Farm 4
2.3 Site Location 5
2.4 Site Selection Criteria 5
2.5 Compatibility of the Blackstone Edge Site with Site Selection Criteria 6

3. Design Influences 9

3.1 Introduction 9
3.2 Planning Policy Context 10
3.3 Design Guidance 13
3.4 Design Consultation 14

4. Design Evolution 17

4.1 Constraints Mapping 17
4.2 Factors Considered in the Development of the Layout 17
4.3 Wind Farm Design 20
4.4 Design Iterations 23
4.5 Comprehensive development of the area 23

5. Development Description 25

5.1 Introduction 25
5.2 Key Elements of the Scheme 25
5.3 Construction Programme 27
5.4 Construction Traffic 28

© Entec UK Limited

5.5 Decommissioning 28

6. Access 29

6.1 Introduction 29

Table 2.1 South Yorkshire Renewable Energy Potential 4
Table 4.1 Landscape Design Constraints and Opportunities 20

Appendix 1 List of Consultees and their Responses

© Entec UK Limited

1. Design and Access Statement

1.1 Introduction

1.1.1 In May 2006 the government introduced changes to the Town and Country planning process. Section 42 of the Planning and Compulsory Purchase Act, 2004 substitutes a new section 62 of the Town and Country Planning Act 1990 to provide that a statement covering design concepts and access issues is submitted with an application for planning permission.

1.1.2 This Design and Access Statement has been produced in accordance with the Department for Communities and Local Government (DLCG) Circular 01/2006 *'Guidance on Changes to the Development Control System'*, and with reference to the Commission for Architecture and the Built Environment publication '*Design and Access Statements – how to write, read and use them'* (2006). It accompanies a planning application submitted by E.ON UK plc 'the Applicant' for a proposed wind farm at Blackstone Edge, Crow Edge, South Yorkshire. The planning application is accompanied by two other key documents:

1) an Environmental Statement, which comprises:
   a. Environmental Statement, Volume 1: EIA Assessments;
   b. Environmental Statement, Volume 2: Figures and Visualisations;
   c. Environmental Statement, Volume 3: Technical Appendices; and
   d. Environmental Statement, Non Technical Summary (NTS).
2) a Planning Statement.

1.1.3 The Design and Access Statement explains the design thinking behind a planning application, providing an explanation of the design principles and concepts that have informed the Proposed Development (as described in Chapter 4 of the Environmental Statement) and how transport and access issues have been taken into consideration.

1.2 Methodology

1.2.1 The design process involved in formulating the design of the proposed Blackstone Edge Wind Farm has been lead by a combination of engineering requirements and environmental design, in order to produce an appropriate layout in terms of function and energy yield whilst seeking to avoid or reduce environmental effects (in accordance with the requirements of the *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations* 1999 and *Planning Policy Statement 22 - Renewable Energy)*. The environmental impact assessment process also exploits opportunities for positive design, rather than merely seeking to avoid adverse environmental effects. The Design and Access Statement is seen as having an

© Entec UK Limited

important role in contributing to the design process through the clear documentation of design evolution.

1.2.2 Wind farms are a sustainable form of development, based on the production of clean, renewable energy. As such, the potential environmental effects are usually associated with the construction period and the reversible effects of wind turbines on the landscape and visual amenity. The proposed wind farm has therefore been developed with environmental considerations at the forefront of both selection and site design. This is demonstrated through a site selection process that ensures sufficient buffer zones from all relevant constraints, particularly residential properties. Other factors that have guided the sites design have included the consideration of planning policy, the landowner and the agricultural and environmental management practices of the tenant farmer, existing infrastructure and the views and opinions of the public. A detailed understanding of the existing environment (including land use, highway infrastructure, ecology, hydrology and water quality, ornithology, noise and archaeology) also contributed to the design process via a constraints map and design team meetings. This has ensured a holistic design approach to the proposed wind farm.

1.2.3 The Design and Access Statement is set out in the following way:

- Chapter 2 provides a description of the site selection process;
- Chapter 3 outlines the main influences that have guided the wind farm design process, including planning policy guidelines and consultation with a wide range of organisations;
- Chapter 4 presents the evolutionary process of designing the proposed wind farm turbine layout and associated infrastructure and explains how the design guidelines outlined in chapter 3 have been applied to the site. This chapter summarises factors that were considered in the development of the design and provides the eventual design solution;
- Chapter 5 provides a summary description of the Proposed Development; and
- Chapter 6 considers the issues associated with transportation and access.

© Entec UK Limited

2. Site Selection

2.1 Wind Power

2.1.1 It is now widely accepted that one of the primary causes of climate change is the emission of large volumes of carbon dioxide (CO_2) and other greenhouse gases into the atmosphere by burning fossil fuels, such as coal, oil and gas. Reducing the use of fossil fuels and increasing the proportion of power generated from renewable energy sources is seen as having a vital role in reducing these emissions and slowing climate change (as well as slowing the world wide effects it has on sea levels, water supplies and agricultural patterns).

2.1.2 The Government is now taking positive steps to encourage a regional approach to the development of renewable energy sources. The DTI and DTLR took the initiative for developing Regional Renewable Energy Assessments (RRES) as a means of encouraging the adoption of regional targets within Regional Planning Guidance and Regional Sustainable Development Frameworks. As part of this process all regions were asked to make an assessment of their potential for renewable energy generation and to propose a target for 2010. The results of the assessments were reported by Oxera Environmental in 2002 but since that time further work has been undertaken in the Yorkshire and Humber region.

2.1.3 In December 2004 the Government Office for Yorkshire and Humber (GOYH) and the Yorkshire and Humber Assembly (Y&HA) published a report by AEA Technology[1] titled *"Planning for Renewable Energy Targets in Yorkshire and Humber"*. The study was undertaken to assist the GOYH and the Y&HA develop the regional and sub regional renewable energy targets set out in the revised draft Regional Planning Guidance 12 and to propose how these might be met through the potential at local authority district level.

2.1.4 The following is adapted from Table 6 of the AEAT report to show the South Yorkshire renewable potential for 2010 and the regional total.

[1] AEA Technology (2004) Planning for Renewable Energy Targets in Yorkshire and Humber: A Report for Government Office for Yorkshire and Humber and the Yorkshire and Humber Assembly

© Entec UK Limited

Table 2.1 South Yorkshire Renewable Energy Potential

Sub Region	LA	Wind	Biomass	Co-Firing	Hydro	PV	Total
South Yorkshire	Barnsley	15				0.42	15.4
	Doncaster	10			0.15	0.49	10.6
	Rotherham	10			0.1	0.51	10.6
	Sheffield	10				0.6	10.6
Total		**45**			**0.25**	**2**	**47**
Regional Total		**341**	**14**	**100**	**4**	**9**	**708**

2.1.5 The Yorkshire and Humber Region has these proposed targets reflected in the emerging Regional Spatial Strategy titled the *Yorkshire and Humber Plan* that sets a target of 708MW of renewables capacity to be installed in the region by 2010. The sub regional target for South Yorkshire is also set within the emerging RSS of 47MW also by 2010.

2.2 Blackstone Edge Wind Farm

2.2.1 The Applicant is seeking planning permission to construct and operate a wind farm of 3 turbines, together with associated infrastructure including access tracks, anemometry mast, transformers, substation and underground connection to the electricity distribution network (the 'Proposed Development'). The turbines will have a hub height of up to 60m, a rotor diameter of up to 82m, and a height to blade tip of up to 101m.

2.2.2 The proposed three wind turbines could generate almost as much electricity as the 13 wind turbines at the nearby Royd Moor site. The proposed Blackstone Edge Wind Farm would comprise of the installation and operation of a cluster of three wind turbines, each with an assumed rating of 2MW. The output from three such turbines could generate enough electricity to power up to 3,355[2] homes. Using an assumption that electricity from wind power would offset that produced in the UK from the current energy mix, this would see a reduction in emissions of the greenhouse gas carbon dioxide (CO2) of around 6,780[3] tonnes per year. Such savings in emissions may change depending on the generating mix. In addition the operation of the scheme would reduce the emissions of the gases sulphur dioxide and nitrogen oxides, which contribute to the production of acid rain. The outcome of the procurement process

[2] based on 30% load factor and average annual domestic usage of 4.7 MWh/year (Digest of UK Energy Statistics, 2004)

[3] grid electricity converting factor of 430kg CO_2/MWh (DEFRA)

© Entec UK Limited

may see turbines of slightly larger power output secured, in which case the benefits described above would increase.

2.2.3 The wind farm will have an operational life of 25 years and will include site management to ensure the adequate maintenance of site facilities such as roads, boundaries, gates and signage.

2.2.4 At the end of the operational life of the turbines it is assumed they will be dismantled and removed.

2.3 Site Location

2.3.1 The site is located in South Yorkshire, approximately 15km to the west of Barnsley, 7km south-east of Holmfirth and approximately 1.5km to the north-east of the village of Crow Edge as shown in Figures 1.1 and 1.2. The area where turbines would be sited is situated on agricultural land that is currently used for grazing.

2.4 Site Selection Criteria

2.4.1 This chapter sets out E.ON's approach to site selection for the identification of wind farm sites in the UK.

2.4.2 A range of technical, environmental and economic factors need to be considered when investigating opportunities for wind farm development. Sites are identified either through approaches by landowners, which are then subject to a review by E.ON, or by the identification of sites by E.ON through either sieve mapping exercises or criteria based assessments.

2.4.3 The Blackstone Edge site was originally identified as having potential for a wind farm in early 2006. This was initiated after E.ON was contacted by the landowner of the site. Subsequent initial investigations by E.ON considered the feasibility of the site by applying the site selection criteria to the entire area of Barnsley.

2.4.4 The site selection criteria applied are as follows;.

- Land Use and Context: the existing land use and environmental or planning designations on or near the site.
- Wind Resource: the wind resource on the site.
- Electrical Connection: proximity to electricity grid and its likely capacity.
- Transport Infrastructure: proximity to public road infrastructure for construction, operation and maintenance.
- Residential Amenity: proximity to dwellings and settlements.
- Military and Aviation Constraints: potential effect of wind turbines on military and aviation functions

© Entec UK Limited

2.4.5 On the basis of applying these criteria it was determined that the site showed potential for a wind farm and warranted further detailed environmental and technical assessment.

2.4.6 The site's compatibility with the site selection criteria is summarised in section 2.5.

2.5 Compatibility of the Blackstone Edge Site with Site Selection Criteria

Land Use and Context

2.5.1 A range of constraints have been considered and mapped to identify the site. An initial constraints map was produced to ensure there were no conflicts with National, Regional or Local designations including *inter alia* World Heritage sites, National Parks and SSSI's. No such designations exist within the immediate proximity of the site (see Figure 2.1). However, The closest national landscape designation to the proposed Blackstone Edge Development Site is the Peal District National Park, located approximately 2.5km to the south and south west.

Wind Resource

2.5.2 The Applicant's initial wind resource assessment was based on the existing long term wind data from Royd Moor wind farm. According to the study, the proposed site at Blackstone Edge has an excellent wind potential with an average wind speed that exceeds 8m/s at a hub height of 60m (see Figure 2.1).

Electrical Connection

2.5.3 The Applicant has consulted with the Yorkshire Electricity Distribution Limited (YEDL) and based on their initial assessment the existing substation at Hazlehead would have the capacity to accommodate the proposed wind turbines at Blackstone Edge.

Transport Infrastructure

2.5.4 An Access Study was undertaken for the Blackstone Edge site and confirmed the availability of appropriate transport routes to site for the large components involved. A visual inspection concluded that the preferred route for the transport of wind turbines to the site is from junction 35A of the M1, then continuing along A61/A616/A628/Royd Lane/Whitley Road.

Residential Amenity

2.5.5 In order to ensure that the residential amenity of surrounding properties is protected a constraints map was produced that placed a precautionary 600m buffer zone around all residential properties over a wide area around the site. Figure 2.1 demonstrates that the Blackstone Edge site is not within 600m of any residential properties.

Military and Aviation Constraints

2.5.6 The Ministry of Defence, Civil Aviation Authority and National Air Traffic Services were all sent letters in November 2005 informing them of the proposed development site. The Ministry of Defence and the Civil Aviation Authority raised no objections or

© Entec UK Limited

observations on the proposal. The National Air Traffic Services identified a possible effect on the performance of Claxby radar and as a result of this the Applicant appointed Pager Power Ltd, a consultancy that specialises in aviation and communication studies for wind farms, to assess the significance of the effect. The study undertaken by Pager Power considered the likely operational effects of the proposed wind farm, including a cumulative assessment of operational and consented wind farms, on the provision of en-route air traffic services from National Air Traffic Services (NATS) En-Route plc (NERL). An analysis of significant airspace in the vicinity of the site was conducted and an assessment made of En-Route plc's (NERL) likely concerns. An estimation was provided regarding the likelihood of a sustained NERL objection. Following the full technical and operational assessment undertaken by Pager Power, the risk of a sustained objection from NATS/NERL is considered to be low.

Conclusion

2.5.7 The process which identified the Blackstone Edge site, is a considered process that demonstrates that it is one of very few in the Borough that can accommodate wind development without breaching relevant buffer zones and avoiding national regional and local designations. Data from the anemometry mast at the nearby Royd Moor wind farm demonstrates excellent wind speeds that confirm the viability of the scheme in addition to the aforementioned environmental acceptability.

© Entec UK Limited

© Entec UK Limited

3. Design Influences

3.1 Introduction

3.1.1 Once a site has been selected, the design of the wind farm is optimised in order to produce a design which maximises the use of the land available for wind power generation, balancing this against the overall environmental, social and economic effects of the Proposed Development. Optimising the layout of a wind farm depends on a range of technical, economic, planning and environmental criteria.

Wind Farm Design Criteria

3.1.2 The technical, economic, planning and environmental criteria considered are as follows.

- Ground conditions: ground conditions must be suitable for the installation of wind turbines, access tracks and cables.
- Distance between turbines: to minimise the turbulent interaction between wind turbines (wake effect), turbines should be reasonably separated both perpendicular to, and in line with, the prevailing wind direction. This design feature is a key factor in maximising the overall power generating capacity of a site. Spacing requirements may vary between turbine manufacturers and are also subject to wind conditions.
- Proximity to occupied dwellings: wind turbines have to be located sufficiently far away from houses to protect local amenity from effects relating to issues such as noise and shadow flicker.
- Environmental constraints: features and areas of local environmental sensitivity (ecology, archaeology, hydrology etc) are identified and their implications considered. The principle of incorporating inherent mitigation through proposal design was applied, such that effects were avoided or minimised. Wherever practicable environmental enhancement was achieved, thus going beyond effects mitigation toward net environmental gain. This can be demonstrated for example through the financial contribution made toward the conservation of the lowland heathland in the local area and the planting of approximately 900m of species-rich hedgerows on-site.
- Landscape and visual: landscape and visual design considerations are taken into account and where appropriate the layout modified accordingly.
- Existing land use: whilst the wind turbines and their associated infrastructure typically occupy no more than 5% of the development site, the existing use of the land is considered in the layout of tracks and turbines. For example, existing track lines are used where practicable.

© Entec UK Limited

- Proximity to obstructions: such as tall trees or buildings which can create turbulence in the air flow and reduce the power generated from the site.
- Underground and over-ground services: pipelines and telecommunication links can be affected by wind turbine developments, therefore it is necessary to take into account the presence of such services when designing a wind farm.

3.1.3 Further information on how these criteria have been applied to the site is described in Chapter 4.

3.1.4 In addition to the above considerations, planning guidance and discussion with statutory and non-statutory consultees, the local communities and the landowners also have an influence over the evolution of the design.

3.2 Planning Policy Context

National Guidance

3.2.1 The following national planning guidance and advice has been taken into account in designing the proposed wind farm at Blackstone Edge.

3.2.2 The Government has published over the years a series of advice notes entitled Planning Policy Guidance Notes (PPGs) and, more recently, Planning Policy Statements (PPSs) which set out the approach the Government expects to be taken on a wide range of planning issues. A number of these will be relevant to the current proposal. PPSs and PPGs identify key priorities for the planning system. They may, so far as relevant, be material considerations to be taken into account in development plan preparation and development control. Planning Policy Statements considered included:

- PPS 1 - Delivering Sustainable Development
- PPS 22 – Renewable Energy; and
- PPS 7 – Sustainable Development in Rural Areas

3.2.3 There is then a series of PPGs dealing with other specific topics that need to be taken into account on a proposal of this type. More information on relevant PPGs can be found in Chapter 5 'Planning Policy and Renewables Context' in the Environmental Statement for the Blackstone Edge Wind Farm.

Regional Planning Guidance

3.2.4 *Regional Spatial Strategy 12* was published in December 2004 and is based on a selective review of *Regional Planning Guidance 12*. A key theme of the RSS is the prudent use of natural resources and the following issues;

- Addressing the causes of and responding to the effects of climate change;
- Minimising travel needs and maximising use of energy efficiency modes;
- Limiting pollution to what is compatible with health and biosphere capacity;
- Reducing resource consumption and encouraging use of renewable energy;

© Entec UK Limited

- Promoting the sustainable management of waste.

3.2.5 The adopted RSS 12 has statutory status under the provisions of the *Planning and Compulsory Purchase Act 2004* and as such forms part of the development plan for the purposes of determining planning applications. Policy R12 seeks to ensure that development plans include measures which secure an installed renewable energy capacity in South Yorkshire of 100MW.

3.2.6 There are other policies in RSS 12 which also need to be addressed to ensure compliance. These include the following:

- S1 – Applying the principles of sustainable development;
- S5 – Climate Change
- S6 – Sustainable use of physical resources
- P2 – Green Belts
- E2 – Rural employment opportunities
- N1 – Biodiversity
- N3 – Landscape character

Emerging Regional Planning Guidance

3.2.7 The emerging Regional Spatial Strategy which will supersede RSS 12 was submitted to the Government in December 2005. An Examination in Public took place in September 2006 and the panel report was published in May 2007. Under the proposed provisions of Policy ENV5 the submission document adopts a regional target of at least 708MW of installed renewable energy capacity by 2010. This figure is broken down into sub regional targets which apportion South Yorkshire 47MW capacity by 2010. Despite much debate at the Examination in Public these targets were considered to be appropriate and founded on a sound evidential basis.

3.2.8 Other relevant policies in the emerging plan are as follows;

- YH2 – Climate change and resource use;
- YH9 – Green Belts
- E7 – Rural Economy
- ENV7 - Agriculture
- ENV8 - Biodiversity
- ENV 9 – Cultural heritage
- ENV 10 – Landscape

Local Authority Development Plan

3.2.9 *The Barnsley Metropolitan Borough Council Unitary Development Plan* was adopted in December 2000. Volume 1 of the UDP is broken down into two parts; the first part

© Entec UK Limited

details the overall framework and strategy for the UDP and lists the strategic policies for the borough. The second part provides the policy justification for those policies listed within part 1. Volumes 2-13 of the UDP are community area volumes covering the whole borough. Each volume deals with land uses, policies and proposals for their respective areas.

- Policy ES12 relates to development associated with wind energy generation and states a range of criteria that proposals for wind energy will be assessed against. The criteria cover the following issues; cumulative impact, residential amenity, transport and access, ecology & cultural heritage, agricultural impacts, electro magnetic effects, supply of electricity and shadow flicker.
- Policy ES12A requires appropriate technology and design of wind energy proposals including appropriate colouration of turbines.
- Policy ES12B places a requirement on developers to restore sites used for wind energy developments within one year of the cessation of active use to their original condition.

3.2.10 There are other policies in the Unitary Development Plan which also need to be addressed to ensure compliance. These include the following:

- GS7 – Seeks to maintain the openness of the Green Belt and not conflict with the purposes of including land within the Green Belt.
- GS8 – Ensures new buildings in the Green Belt are only permitted in very special circumstances.
- GS9 – Aims to protect the visual amenity of the Green Belt
- GS15 – Seek to safeguard important habitats and species from disturbance, pollution or other damage.
- GS16 – Seeks to avoid adverse effects of development on *inter alia* habitats or species protected by law.
- GS18 – prevents development that would affect *inter alia* Natural Heritage Sites unless there is a clear need for the development.
- BE2 – Seeks to avoid adverse effects on listed buildings.
- BE3 – adopts a presumption in favour of physical preservation of archaeological remains
- BE6 – Seeks to achieve to achieve good design standards for all types of development
- T2 – seeks to ensure development does not have adverse effects on highway safety.
- WR13 – Ensures designated sites are protected in accordance with Policy GS15. There are six Natural Heritage Sites in the locality which are as follows; Whitley Edge (WR13/3), Broadstone Reservoir (WR13/4), Ingbirchworth Reservoir (WR13/5), Royd Moor Reservoir (WR13/6), Scout Dike Reservoir (13/7) and Small Shaw and High Bank (WR13/8) (part).

© Entec UK Limited

Emerging Local Planning Policy

3.2.11 *The Barnsley Local Development Framework* was published for consultation in October 2005 and included the preferred options for both the Core Strategy and the Policies document. The LDF includes a vision to make Barnsley a successful, uniquely distinctive 21st century market town at the centre of a borough offering prosperity and opportunity for all. At this early stage in the production of the LDF its provisions carry little weight in the determination of planning applications, however, they are still a material consideration.

3.2.12 The core strategy includes a number of core aims for Barnsley including supporting renewable energy facilities to increase the amount of renewable energy produced in the borough. Policy EN1 of policies document states that development producing renewable energy will be allowed provided there are no significant effects on landscape character, living conditions and biodiversity.

3.2.13 Other policies of relevance include;

- GD1 – General Development
- T4 – Highway Safety
- T5 – Highway Design
- GB1 – Development in the Green Belt
- BIO2 – Development on locally designated biodiversity sites
- BIO3 – Protecting species and habitats
- LCA1 – Protecting and improving landscape character
- D6 – Design Statements
- T5 – Highway Design
- HE3 – Listed Buildings – effect of development
- HE6 - Archaeology
- HE7 – Archaeology and development (preserving in situ)
- HE8 - Archaeology and development – preserving in situ and by record

3.3 Design Guidance

3.3.1 The Design and Access Statement has been prepared with reference to a number of 'best practice' documents and in particular, the following publications and guidelines:

- *Guidelines on Environmental Impacts of Wind Farms and Small Scale Hydro Electric Schemes, SNH, 2001;*
- *Guidance for the Assessment of Cumulative Landscape and Visual Impacts Arising from Wind farm Developments, SNH Advisory Services Landscape Group, 4th Draft May 2004. The Countryside Agency Landscape Character Initiative;*

© Entec UK Limited

- *Countryside Commission's Countryside Character Vol.3 : Yorkshire and the Humber;*
- *Barnsley Metropolitan Borough Council: Landscape Character Assessment (2002).*
- *Scottish Natural Heritage, 22/07/05 'Visual Analysis of Wind farms – Good Practice Guidance (Consultation Draft)', Horner & Maclennan and Envision; and*
- *Visual Representation of Wind Farms - Good Practice Guidance, 29. March 2006*

Design Guidance: The Countryside Commission

3.3.2 Vol.3 of the *Countryside Commission Landscape Character Assessment* relates to the Yorkshire and Humber region. The design of the site has had regard to the key characteristics of landscape Character Areas (LCA) 37 – Yorkshire Southern Pennine Fringe. However, this landscape character assessment does not offer any specific design guidance with regards to wind farm development.

Design Guidance: Barnsley Metropolitan Borough Council

3.3.3 *The Barnsley Council Landscape Character Assessment* was adopted in 2002 and provides a comprehensive LCA for the entire Borough. The Blackstone Edge site sits within the Thurlstone and Langsett Unenclosed Moorland Landscape Character Area (A1). This Landscape Character Assessment does not contain any guidance on the design of wind farms but the proposals have due regard to its findings.

Design Guidance: Scottish Natural Heritage

3.3.4 The '*Guidelines on the Environmental Impacts of Wind Farms and Small Scale Hydroelectric Schemes'* published by Scottish Natural Heritage provides detailed advice on design, and general advise on relating scale of wind farm and turbine size to the existing landscape scale and character, aiming to achieve a sensitive, sculptural and simple image that appears rational to the landscape setting. In the case of cumulative effects, a simple image may be retained by all of the developments retaining a similar image and relationship in the landscape. Further guidance is provided on the design and layout of roads and ancillary development.

3.4 Design Consultation

3.4.1 E.ON has undertaken a programme of public consultation. This began in November 2006 with the production of a letter for parish and town councils within 3km of the proposal introducing the project. These Councils included Dunford, Penistone, Gunthwaite & Ingbirchworth, Denby Dale and Holme Valley.

3.4.2 In December 2006 an introductory newsletter for local residents was made available from the Wind Mill Café at Royd Moor Wind Farm.

3.4.3 This was followed in February 2007 by the distribution of a newsletter to 3173 households within 5km of the proposal. Copies of the newsletter were also sent to the above parishes, the Penistone & District Community Partnership and the Wind Mill Café. The newsletter invited local people to join the Blackstone Edge Mailing List to

© Entec UK Limited

express their views on the proposal and share their ideas on community benefits. To date over 40 people have joined the Blackstone Edge Mailing List.

3.4.4 A public exhibition was held at the Crow Edge Community Centre on March 27th and 28th 2007. The event was advertised locally and invites were sent to the above 3173 households, parish and town councils, the Penistone & District Community Partnership and the Wind Mill Café. A 'welcome pack' with the March newsletter, E.ON's community benefits proposal, a feedback form and general information about wind energy was distributed to all attendees. Over 110 people attended.

3.4.5 The main issues raised by local people at the exhibition are summarised in Chapter 11 of the Environmental Statement, and are addressed there or in other technical chapters.

3.4.6 In April 2007 the public exhibition handouts (i.e. the 'welcome pack') were sent to all members of the Blackstone Edge Mailing List.

3.4.7 The Blackstone Edge webpage, www.eon-uk.com/3253.aspx, was created in December 2006 and is it regularly being updated with the latest news on the progress of the proposal.

Organisations Consulted

3.4.8 The Local Planning Authority were consulted at an early stage with initial contact made in July of 2006. The LPA were informed of the initial ideas for the scheme and the results of the initial consultations and studies undertaken. Following on from this a meeting took place prior to the submission of the scoping document. A range of issues were discussed and the LPA advised that a robust cumulative impact assessment would be required to address the combined effects of the Royd Moor wind farm and the (then undetermined) Hazelhead wind farm.

3.4.9 As well as consulting with Barnsley Metropolitan Borough Council and also seeking a formal scoping opinion, consultation was undertaken with a wide range of other relevant organisations. A full list of organisations consulted is provided in Appendix 1.

3.4.10 Consultations were also undertaken with a range of utility and telecommunication companies and bodies representing aviation interests.

3.4.11 More detail on the specific consultees' responses is provided in the relevant Chapters of the Environmental Statement.

© Entec UK Limited

© Entec UK Limited

4. Design Evolution

4.1 Constraints Mapping

4.1.1 The starting point for the design of the site is a detailed constraints map which demonstrates all relevant buffer distances, key features and other factors that will constrain the location of wind turbines.

The Role of EIA in the Design of the Proposed Wind Farm

4.1.2 The process of EIA plays an integral part in the design of the site as it enables all the technical constraints to be identified which restrict the location of wind turbines. The evolution of design has been informed by matters such as stand off distances to residential properties, nearby watercourses, public roads and footpaths. This process allows the turbines to be sited in the most appropriate locations with minimal environmental impacts.

4.2 Factors Considered in the Development of the Layout

4.2.1 Where appropriate to do so the factors described below were mapped onto a constraints plan that was then used to establish the design of the wind farm (see Figure 4.1).

Technical Constraints

4.2.2 Following on from site selection the technical constraints that are mapped are as follows;

- Toppling distance from roads (rounded up to 111m in this case based on total turbine height +10%).
- Oversailing distance from site boundary (43m buffer inside the site boundary, based on potential rotors under consideration albeit that a 41m rotor radius now proposed).
- 50m buffer around the quarry and landfill sites: this buffer was maintained in order to avoid geotechnical stability issues.
- Distances between wind turbines; to minimise the turbulent interaction between wind turbines (wake effect), turbines should be reasonably separated both perpendicular to, and in line with, the prevailing wind direction. This design feature is a key factor in maximising the overall power generating capacity of a site. Spacing requirements may vary between turbine manufacturers and are also subject to wind conditions.
- 20m buffer from water bodies and watercourses, including Blackwater Dyke: this buffer was maintained in order to minimise the potential contamination of watercourses during construction.

© Entec UK Limited

Relevant Planning Policies

4.2.3 The planning policies identified in section 3.3 have been taken into consideration in the site selection process and also subsequently, where relevant, in the design of the Proposed Development.

Public Consultations

4.2.4 The public consultation exercise detailed in section 3.5 is often a useful tool in informing site design. During consultations the applicant was approached by The Huddersfield & District Model Aircraft Club in relation to an area located immediately to the north east of the Blackstone Edge site within which they fly model aircraft (in accordance with a relevant planning permission). The operators of the club have raised concerns over the potential conflict between their activities and the location of the wind turbine nearest to the area within which they fly model aircraft (wind turbine number two on Figure 1.2). E.ON have considered the possibility of moving the wind turbine but it was concluded that this was not possible due to noise/residential amenity constraints. E.ON UK and the Club have identified a mutually satisfactory solution that will enable the model aircraft flying activities to co-exist with the existence of the wind turbines.

Land Use

4.2.5 In the development of the proposed wind farm layout consideration has been given to minimising agricultural land loss and the effect on farming practices during the construction and operation of the wind farm. The Landowner has indicated a preferred area within the site for farming activity and where possible, the design has ensured that the loss of this area has been kept to a minimum.

Noise

4.2.6 The two closest properties to the proposed Blackstone Edge site are to the west at a distance of 616m Maythorn and to the east at a distance of 690m Spicer House. The site has been developed to ensure that a precautionary stand off distance from residential properties of 600m can be achieved and as such has been developed within acceptable noise criteria. Confirmation that this has allowed the development to be within acceptable noise criteria is provided in Chapter 6 of the Environmental Statement.

Ecology and Ornithology

4.2.7 The Blackstone Edge site is not the subject of any international, national or regional nature conservation designations and is dominated by improved grassland. Habitats of significance within the area immediately surrounding the site include species-rich grasslands, standing water and woodland copses. The surveys undertaken reveal that there are low levels of ecological and ornithological sensitivity associated with the site. These are discussed in more detail in Chapter 8 of the Environmental Statement.

Archaeology and Cultural Heritage

4.2.8 The site lies within an area of enclosed upland common, whose current field boundaries comprise a mix of dry stone walls and post and wire fences. Within the enclosed pasture fields of the site there are no further visible features of cultural heritage interest.

© Entec UK Limited

4.2.9 During the Second World War (1939-1945) the site was used as a bombing decoy to minimise bomb damage to the city of Leeds. This was achieved through the construction of fire pits and ponds to confuse bomber planes. There are no visible remains of these 'bomb decoy' features, nor are they designated as features of archaeological importance. However, the recorded location of the 'bomb decoy' features has been avoided.

Geology

4.2.10 Geological records indicate that the site is underlain by the Greenmoor Rock sandstone and shales of the Lower Coal measures. There is a small fault line to the south-west of the site. There has been no recorded movement of this fault line and, based on advice received from SYMAS, it should not pose a stability problem for the development. In any case, ground investigations will be completed prior to construction and the design process has avoided siting turbines within the vicinity of this fault line where possible.

4.2.11 A closed landfill site (now filled and no longer used) is located immediately to the south of the site. The wind turbines are located at a sufficient distance from this landfill such that risks to the structural integrity of the foundations will be minimised. Similar factors have been applied to siting turbines in relation to the existing quarry to the south-east of the site.

Landscape and Visual

4.2.12 The 'design/layout' of the wind farm has been largely determined by the technical constraints on the site. However, the principal landscape design objectives of the Blackstone Edge Wind Farm remain, as assessed within the LVIA, as follows:

- Develop the wind farm and associated infrastructure designed to respond to the local landscape character and provide an acceptable design solution in terms of scale, layout and visual composition;
- The aim of the design process is to achieve a simple, balanced, rational, and coherent image that may be viewed as an acceptable or positive component of the visual composition;
- Minimise landscape and visual effects on views from local residents and communities;
- Minimise landscape and visual effects from recreational areas/routes and popular hilltops; and
- Minimise landscape and visual effects from main transport routes.

Landscape Design Constraints and Opportunities

4.2.13 Analysis of the site area, landscape character, and early wind farm design has led to the identification of a number of landscape and visual design opportunities and constraints, which are listed in Table 4.1 below.

© Entec UK Limited

Table 4.1 Landscape Design Constraints and Opportunities

Item	Design Constraint	Design Opportunity
Yorkshire Southern Pennine Fringe LCA	Potential visibility from higher ground and adjacent local landscapes. The receiving landscape is identified as medium sensitivity being locally designated as Area of Borough Landscape Value (ABLV).	Actual site area in an open, upland farmland location within a medium – large scale landscape with a demonstrated capacity to accommodate turbines, with the existing Royd Moor Wind Farm located directly east of the Blackstone Edge Wind Farm site.
Ingbirchworth Upland Farming LLCA	Potential visibility from surrounding high ground within the Upland Farming Area. The receiving landscape is identified as medium sensitivity being locally designated as Area of Borough Landscape Value (ABLV).	Actual site area in an open, upland farmland location within a medium – large scale landscape with a demonstrated capacity to accommodate turbines, with the existing Royd Moor Wind Farm located directly east of the Blackstone Edge Wind Farm site. Design to retain and enhance existing hedgerows, mature trees and stone walls in wind farm site and access road layouts to conserve and enhance the local landscape character.
Blackstone Edge Site	Location of turbines to relate to the environmental constraints plan and technical criteria. Open, hill top location reduces possibility to screen turbine bases, tracks and ancillary development from some views.	Design to retain and enhance existing hedgerows, mature trees and stone walls in wind farm site and access road layouts to conserve and enhance the local landscape character.
Visual Amenity	Views and amenity of local settlements and communities, local walks and viewpoints. Particularly important are the long distance views from the Peak District National Park to the south and west.	Design to protect visual amenity and where visible, aspire to provide a positive contribution to the landscape in terms of scale, and simplicity of image or visual composition.

4.3 Wind Farm Design

4.3.1 Initial technical analysis of the site using the constraints plan and other factors identified above indicated capacity for 3 turbines. The heights, numbers and locations of the turbines were then assessed in relation to noise and also in terms of landscape and visual composition, as described below.

Noise

4.3.2 The proposed layout was assessed to determine whether noise levels at sensitive receptors would be within acceptable limits. This noise assessment was undertaken based on the following approach.

4.3.3 Existing noise levels were measured at the two nearest receptors to the proposed wind farm; Maythorn (on Calf Hey Lane to the west of the site) and Spicer House (to the north-east of the site). In protecting the two nearest properties, the amenity of those further away will also be protected.

© Entec UK Limited

4.3.4 Noise levels were measured for a two week period and were also correlated with wind speed data to determine the 'average' background noise level at wind speeds of up to 12m/s. As part of the noise assessment, noise limits were derived using the procedure set out in *The Assessment and Rating of Noise from Wind Farms (ETSU-R-97)* (Department of Trade and Industry, 1996). As such the derived noise limits for the assessment are 5dB above the background for each wind speed, with a lower limit of 35dB during the day and 43dB at night. The noise from the proposed Blackstone Edge wind turbine locations was predicted for each of the nearest properties using data provided by the turbine manufacturer. Noise from the existing Royd Moor wind farm and the recently approved (subject to Government Office decision) Hazlehead (Crow Edge) wind farm has also been included in the model. The ETSU-R-97 derived limits were met at both locations for the proposed layout, confirming the protection of noise amenity to the design process.

Landscape and Visual Composition

4.3.5 The *'Guidelines on the Environmental Impacts of Wind farms and Small Scale Hydroelectric Schemes'* published by Scottish Natural Heritage advise on the following design criteria which would be appropriate to this site location:

- Retention of 'simplicity of image', by relating the layout design to the underlying landscape character;
- Relating scale of wind farm and turbine size to the existing landscape scale and character aiming to achieve a 'sensitive, sculptural and simple' effect that appears rational to the landscape setting;
- In the case of cumulative effects, a simple image may be retained by 'all being of a similar image and relationship in the landscape'; and
- Further guidance is provided on the design and layout of roads and ancillary development.

Turbine Selection

4.3.6 Early layouts were theoretically run on computer software to look at the sizes of turbines which could be placed comfortably into the landscape to fit with the scale and character of the site, and the proposed turbines alongside the existing Royd Moor Wind Farm to the south-east of the site, and the consented Hazelhead Wind Farm to the south-west of the site. Turbine heights were considered at 125m/115m/100m/80m to blade tip. It was concluded that a turbine of a similar height to the proposed turbines at Hazelhead Wind Farm presented as a best fit visually within the landscape, and the elevated upland landscape could accommodate the scale of the turbines at 100m blade tip without potential adverse scale effects with the neighbouring Royd Moor Wind Farm at 54m height to blade tip. It should be noted that the Royd Moor wind turbines will be decommissioned in 2018 at the latest.

4.3.7 This process considered the medium to large scale of the landscape and the scale indicators of the existing turbines at Royd Moor using assessments during site visits, Zone of Theoretical Visibility, wireframe and photomontage analysis. It was concluded that at this particular site, the height of the turbines were a crucial design factor and of more importance than the locations of the turbines.

© Entec UK Limited

4.3.8 The landscape and visual assessment has been completed on a turbine specification of 3-bladed turbines with a maximum height to blade tip of 101m. These are based on a model which is 60m to hub height and 82m rotor diameter which creates a balanced, slender form. This height is in line with current turbine manufacturer's specifications and is comparable in height to other existing and approved wind farms within the UK.

Visual Context

4.3.9 Viewpoint analysis of the layout design options considered the following factors:

- the main axis of view or direction from where most visual receptors would view the wind farm;
- the landscape grain, scale, enclosure and presence of scale indicators Scale indicators are familiar objects in the landscape such as trees and buildings that appear in close proximity to the wind farm and provide an indication of the true scale and height of the turbines.;
- apparent extent and depth of the development when viewed from the viewpoints;
- overall composition and simplicity of image (avoidance of outlying or overlapping turbines, gaps);
- proportion of background/skyline against which the turbines would be viewed and consideration of colour selection;
- appearance of the wind farm from moving receptors on the local road network, and in particular recreational receptors on the local footpath/bridleway network to the north and south.

4.3.10 Areas of potential visibility within the study area have been examined from approximately 45 viewpoints within the Resoft © Wind Farm model and the design developed to reduce visual affects and enhance the composition of what remained visible from these viewpoints.

Turbine Colour

4.3.11 From most viewpoints the turbines would be viewed against the background sky. For these reasons the turbines are proposed to be coloured pale grey with a semi-matt finish to reduce their contrast with the background sky. The turbines would be uniform in colour and would not support company logos or similar. Transformers would be located within turbine towers or externally alongside at the base of each turbine tower. This detail is dependent on the model selected through a competitive procurement process.

Turbine Movement

4.3.12 The turbines will introduce movement to the landscape, however, the movement will be slow and regular with each machine turning at the same speed and in the same direction. The rotation speed will range 6 to 18 rpm and will be slower than the rotation speed of smaller turbines.

© Entec UK Limited

4.4 Design Iterations

4.4.1 As described above, an initial layout was identified based on the constraints map and other influencing factors outlined, this layout was then reviewed in relation to noise and landscape and visual issues, which were considered to be acceptable and within relevant limits.

4.4.2 Minor changes were made to the initial locations of the wind turbines in order to improve the separation distances between the turbines.

4.4.3 The final proposed location of the turbines, access tracks and other site infrastructure, in relation to the identified environmental constraints is shown in Figure 4.2.

4.5 Comprehensive development of the area

4.5.1 The Blackstone Edge Wind Farm is approximately 700m north of the existing Royd Moor wind turbines. During meetings held between E.ON UK plc, Entec and Barnsley MBC on 13th March, 15th May and 12th June 2007, Barnsley MBC requested that consideration be given to the timing of decommissioning Royd Moor. This request was on the basis that potential adverse cumulative effects of the proposed scheme with Royd Moor could be reduced by minimising the overlap between their operational phases. Additionally, Barnsley MBC requested that consideration be given to any potential plans for the re-powering of Royd Moor and the implications that this might have on the area if the Blackstone Edge proposal is consented.

4.5.2 This section seeks to provide a summary of the decommissioning issues associated with Royd Moor and the design guidelines that are recommended to be adopted if Royd Moor is replaced.

4.5.3 E.ON UK plc operates a 50:50 Joint Venture of the Royd Moor site and at this stage cannot confirm a decommissioning date, though, in accordance with the planning permission for Royd Moor, it can be said that the site will be decommissioned at the latest by 2018. As a maximum therefore, there will be an 8 year overlap between the proposed Blackstone Edge scheme and the existing Royd Moor wind turbines. The potential for cumulative landscape and visual effects was recognised during the scheme design process and has considered both the Royd Moor site as well as the now consented but not yet built Hazlehead scheme, in developing what is considered to be a complementary and acceptable design.. The cumulative landscape and visual effects are considered in detail in chapter 7 of the ES.

4.5.4 In terms of opportunities for re-powering the turbines at Royd Moor, since the turbines were built technology has progressed and these advances mean that fewer, more powerful wind turbines would be preferred. Whilst modern wind turbines are almost twice the size of the Royd Moor wind turbines they can generate up to five times more electricity. Additionally, design guidelines have changed and as such it is considered by E.ON UK plc that it would not be possible to locate modern wind turbines in exactly the same positions as the old ones (modern wind turbines, *inter alia*, require greater distances from properties, greater separation between individual turbines and also greater distances from roads) . In summary, E.ON consider that there is no scope to re-power Royd Moor in its existing scale and layout.

© Entec UK Limited

4.5.5 In terms of any potential future proposal for wind turbines in the Royd Moor area, it is considered by E.ON that any proposals could be effectively coordinated with the Blackstone Edge and Hazlehead schemes in order to minimise potential adverse cumulative effects and, to effectively provide a 'one wind farm' design solution.

© Entec UK Limited

5. Development Description

5.1 Introduction

5.1.1 This section provides a summary description of the proposed development incorporating the key elements of the scheme and their characteristics. A more in depth commentary of each of these elements is included in Chapter 4 of the Environmental Statement.

5.1.2 As previously stated, the proposal is to construct and operate a wind farm of 3 turbines, together with associated infrastructure in order to generate electricity without emitting CO_2 and other greenhouse gases. There are also the purposes of contributing to security of electricity supply and to contributing to regional and sub-regional renewable energy targets. The Proposed Development is designed with an operational life of 25 years. Whilst the wind farm would be un-manned, operational activities will include site management to ensure adequate maintenance of site facilities such as roads, boundaries, gates and signage. A remote computer will monitor the wind farm and each turbine will run automatically under the control of its own integral computer. Decommissioning will include restoration and removal of remaining above ground structures. Roads would either be left for use by the landowner or removed and the land reinstated for agricultural use.

5.2 Key Elements of the Scheme

Number and Specification of Wind Turbines

5.2.1 The proposed Blackstone Edge Wind Farm would comprise of the installation and operation of a cluster of three wind turbines. Each turbine would consist of a hub height of up to 60m and 41m blade radius of up to 41m and could generate enough electricity to power up to 3,355[4] homes. Using an assumption that electricity from wind power would offset that produced in the UK from the current energy mix, this would see a reduction in emissions of the greenhouse gas carbon dioxide (CO_2) of around 6,780[5] tonnes per year. The final choice of turbines is dependent on a competitive tendering process which will not affect the maximum tip height of 101m.

5.2.2 The area where the turbines would be sited is shown in Figure 1.2 and at the present time is used for grazing. The area taken by the proposed development is small and therefore it is anticipated that the existing land use will continue largely unaffected.

[4] based on 30% load factor and average annual domestic usage of 4.7 MWh/year (Digest of UK Energy Statistics, 2004)

[5] grid electricity converting factor of 430kg CO_2/MWh (DEFRA)

© Entec UK Limited

Access and Site Tracks

5.2.3 The proposed access route is discussed in greater detail in Section 6 of the Environmental Statement and is shown in Figure 5.1 of this document. The selected route briefly comprises access from Junction 35a of the M1 continuing along the A61, the A616, A628, Royd Lane and Whitley Road.

5.2.4 New on site access tracks will be required for the purposes of providing access to the wind turbines and these are illustrated in Figure 1.2. The tracks are typically 4.5 to 5.0m wide with 0.5m shoulders on each side made of crushed stone.

5.2.5 The layout of the tracks is developed to ensure track length is kept to a minimum thus reducing the environmental impact whilst avoiding sensitive features identified through the EIA. The tracks are located to closely follow existing field boundaries to minimise disruption with all site tracks utilising stone from local quarries.

5.2.6 In addition to the site tracks themselves, areas of hardstanding measuring 20m x 40m and four small areas of hardstanding of 2.5m x 2.5m x 0.5m would be required at each wind turbine position to support the crane (including outriggers) used for the erection of the wind turbines.

The Construction Compound

5.2.7 The construction compound will measure 40m x 40m and be located in the south west of the site. It will be surrounded by security fencing and will comprise the following;

- Temporary port-a-cabins and port-a-loo's
- Parking for cars and construction vehicles
- Low noise generator
- Containerised storage for various components and materials required for construction; and
- Storage of any other components.

Turbine Foundations

5.2.8 The wind turbine foundations would require an excavation of approximately 18m by 18m and up to 3m in depth. The foundations would typically have dimensions of up to 16m x 16m x 1.5m, giving an additional one metre all around the foundations to allow shuttering access, with the shuttering positioned and supported. The detailed civil engineering design of the foundation would be carried out after the final selection of wind turbine and the granting of planning approval, and would also take account of geotechnical conditions identified in detailed ground investigations carried out post consent.

Climate Monitoring Mast

5.2.9 A climate monitoring mast (anemometer) will be erected at the same height as the proposed hubs of the turbines. The mast will consist of a lattice tower with wind monitoring equipment.

© Entec UK Limited

Site Cable Runs

5.2.10 The electricity produced from each turbine will be converted by a transformer with underground cables linking the turbines. Cable Runs will be located in a trench approximately 1m deep and 0.5m wide.

Grid Connection

5.2.11 A building will be required at the site to house metering and protection equipment. The control building and electrical substation will be located in the same position as the temporary construction compound in the north west corner of the site, as shown in Figure 1.2. The building will be of a single storey apex roofed design and will have dimensions no larger than 12m x 8m x 6.5m. The grid connection will be via the Hazlehead Primary with an underground power line connecting the wind farm to the local distribution grid network.

5.3 Construction Programme

Construction Phases

5.3.1 Construction would consist of the following phases;

- Improvement of the site access;
- Construction of a temporary construction compound for off-loading materials and components and to accommodate site offices and welfare facilities;
- Construction of site tracks for access to turbine locations;
- Construction of the control building and electrical substation;
- Construction of turbine foundations;
- Construction of the cable to the grid connection point;
- Excavation of cable trenches and the laying of electricity and communication cables;
- The delivery and erection of turbine towers and installation of nacelles and blades;
- Commissioning of the Wind Farm; and
- Site reinstatement.

5.3.2 An indicative construction programme is provided in Box 5.1.

© Entec UK Limited

Box 5.1 Indicative construction programme	Month								
	1	2	3	4	5	6	7	8	9
Access Track Work									
Foundation Work									
Control Building									
Turbine Erection									
Electrical Installation									
Testing and Commissioning									
Development Site Clearance									
Development Site fully commissioned and operational									√

5.4 Construction Traffic

5.4.1 Equipment would be delivered to site at the commencement of the relevant construction phase and would be intended to remain on site until work is finished. Such equipment would include excavators, and dumptrucks used for dragging foundations, road making and cable installations. In addition two cranes would be required to be brought to site for erecting the turbines.

5.4.2 The majority of plant and delivery vehicles used during construction would be of standard dimensions. The exceptions to this will be the vehicles used to deliver turbine blades and the large crane transportation vehicles. The remainder of the wind turbine components would be delivered to the site on flatbed articulated trailers. Typically a crane of 1000 tonne lifting capacity and a mobile crane of 100 tonne lifting capacity would be required for the erection of the turbines. A typical crane of 1000 tonne lifting capacity would have a travelling weight of 128 tonnes. It would be delivered on separate trailers and erected on site.

5.4.3 The individual elements of traffic generation are considered in further detail in Chapter 10 of the Environmental Statement.

5.5 Decommissioning

5.5.1 Following the operational life of the wind farm it will be decommissioned unless alternative options such as further consents are sought. The turbines and associated infrastructure would be removed in accordance with industry good practice and/or in compliance with any planning conditions. This element of the scheme involves the complete removal of the turbines, mast, switchgear, and other equipment, the removal of all infrastructure located up to 1.2m below ground level and the re instatement of these areas to their original condition prior to the wind farm being built. The decommissioning process would take approximately two months to complete and will be in accordance with a decommissioning programme that will have been agreed with the planning authority prior to the commencement of the works.

© Entec UK Limited

6. Access

6.1 Introduction

6.1.1 This part of the statement is intended to demonstrate the issues and options considered during the development of the proposals to ensure that the transport and construction of the wind farm causes the minimum disruption to the highway network and highway safety.

6.1.2 There is one access point to the Development Site. In addition, the site access track and associated track layout, linking wind turbines and other infrastructure, see Figure 1.2.

6.1.3 Access to the Development Site and the accompanying track layout has been designed to accommodate the range of vehicles anticipated during the construction and operation of the proposed wind farm, the largest anticipated vehicles are HGVs required to deliver or replace the turbine components.

6.1.4 It should be noted that there are no existing rights of public access to the site and no proposal for such provision as part of the development. Therefore consideration of inclusive access and vehicular and transport limits with regard to the general public have not been considered further.

6.1.5 Traffic and Transport has been considered in Chapter 10 of the Environmental Statement.

Existing Highway Environment and Highway Context

Existing Road Network, Main and Minor

6.1.6 The preferred option for access for turbine components to the Development Site will be via Junction 35a of the M1 continuing along the A61/A616 towards Stocksbridge. A right turn is then required onto the A628 at the Flouch Roundabout, before turning left into Millhouse Green onto Royd Lane, which leads onto Whitley Road and the site access.

6.1.7 At the site access point a track running off the Whitley Road leads directly into the development site. It is proposed to utilise this track to access the turbines directly. This track will require some upgrading works in order to accommodate the construction traffic. The site access track has been designed to accommodate general construction traffic, delivery of turbine components (for example rotor blades and tower sections) and plant required during the construction, operation and decommissioning phases.

© Entec UK Limited

Development Requirements

Construction Phase – Delivery of Materials

6.1.8 During the construction phase the main transport movements will be associated with the movements of commercial Heavy Goods Vehicles6 (HGVs) to and from the site. Vehicles will be associated with delivering turbine components, cabling, aggregate, sand, concrete and the movement of site workers to and from the site.

Operational Phase – Delivery of Spare Parts, Maintenance, etc

6.1.9 Once the development 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 activities. The vehicle used for these visits is likely to be a 4x4 or similar and there may be an occasional need for a HGV to access the site for maintenance and repairs.

Decommissioning Phase

6.1.10 The turbines will be dismantled and removed at the end of the 25 year operational life. HGVs will be required to remove equipment and materials from the site. Traffic would be similar in nature to the construction phase but on a smaller scale.

Public Access and Transportation Links

6.1.11 It is intended that the wind turbines, substation and other infrastructure on site will only be accessed by construction personnel and maintenance teams who will periodically attend the site to, for example, carry out routine maintenance and servicing of turbines. It is not intended that the wind farm turbines and associated infrastructure will be accessed by the general public.

Access Design Process

6.1.12 Entec were appointed to undertake preliminary assessments of the ability of the potential delivery routes to accommodate the large components that make up the wind turbines. A GIS swept path analysis assessment was undertaken to identify if the delivery route can accommodate the swept path of the abnormal load delivery vehicles carrying components such as the turbine blades and nacelle. This type of analysis is consequently used to identify any necessary works. In addition preliminary design work for the main site entrance and subsequent internal site access road, linking with the track connecting the turbine layout was undertaken.

6.1.13 This initial work identified that the development site was capable of accommodating the delivery of large turbine components (such as blades) from the M1 via Whitley Road along the route outlined in 6.1.5.

Design Evaluation

6.1.14 The design of the proposed development has taken into consideration the movement and subsequent access of vehicles involved with the construction and operation of the wind farm. The initial site selection considered potential access restrictions associated

[6] Heavy Goods Vehicles (HGVs) are defined as goods vehicles exceeding a gross vehicle weight of 7.5t

© Entec UK Limited

with the movement of vehicles required to transport large turbine components, such as blades, and this was subject to a further assessment using detailed topographical survey information.

6.1.15 The internal access roads have been designed to take into consideration technical and environmental constraints. The layout for the site access roads has been designed to meet engineering constraints of gradient, drainage, and vehicle turning circle requirements. All access tracks have been located as close to field boundaries as possible and their length kept to a minimum, in order to minimise the potential disruption to ongoing agricultural management and land loss. In addition, advantage has been taken of established or natural breaks in hedgerows and other field boundaries when identifying access points from public roads. All site tracks have been located in areas identified during the environmental impact assessment process as not being environmentally sensitive. Finally, all access tracks have been located at least 20m from identified watercourses on site to minimise the potential contamination of watercourses during construction.

© Entec UK Limited

© Entec UK Limited

Figures

© Entec UK Limited



Key

Site boundary

0 km 1.5 km

Scale 1:25,000 @ A3

e·on

Blackstone Edge Wind Farm
Design & Access Statement

Figure 1.1
Site Location Plan

January 2008
19569-A24a.dwg bemb

Entec

Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. Entec UK Ltd. AL100001776.

Appendix 1
List of Consultees and their Responses

Consultee	Date (s) Consulted	Date (s) Responded	Response
Arqiva	20/12/2005	22/12/2005 (by email)	Arqiva had no objections to the proposed development.
BBC	31/01/2006	31/01/2006 (by email)	The development is likely to have a potential impact for 227 houses for whom there is no alternative off air service. An additional 24 homes may also be affected for whom there may be alternative off air services.
BT	20/12/2005	21/12/2005	BT raised no objections.
CAA	30/11/2005	18/01/2006 (by letter)	The CAA had no objections.
Cable & Wireless	20/12/2005	04/01/2006	Cable & Wireless had no objections to the proposed development.
CSS Spectrum	20/12/2005	11/04/2006	CSS Spectrum raised no objections to the proposal.
English Heritage	20/12/2005	14/06/2006 (by letter)	English Heritage identified the proposed development's potential impact on listed buildings at Upper and Lower Maythorn as a matter of concern.
English Nature (now Natural England)	20/12/2005	26/01/2006 (by letter)	English Nature mentioned the Coalfield Heath Projected that aims to restore heathland habitats and the potential to promote it in association with the development. English Nature also highlighted their concern regarding the possible impact on protected species.
Environment Agency	06/11/2006	11/12/2006	A drainage assessment is suggested to determine possible flood risk from increased run off during construction and from road services and other hard standing.
JRC	20/12/2005	19/01/2006 by email)	The proposal is unlikely to affect the link, but if the turbines move more than 200 metres from the initial layout, JRC will need to be informed.
Barnsley Council – Planning	01/09/2006	01/09/2006	Meeting with John Martin on 01/09/2006.
	06/11/2006	11/12/2006 (by letter)	Additional comments and a request for more information regarding TV reception, more detail on light flicker and two further viewpoint locations.
	13/03/07	13/03/07	Scoping meeting. Barnsley MBC requested that earlier decommissioning of Royd Moor is investigated (i.e. earlier than 2018) and design issues related to any future proposals, such as the replacement of Royd Moor, are also considered.
	15/05/07	15/05/07	Follow-up meeting to that held on 13/03/07.
	16/10/07	16/10/07	Further meeting to present progress on the scheme.
Barnsley Council - Drainage Officer	06/11/2006	11/12/2006	Identifies that there is a water body on site which has a significant environmental impact and mitigation

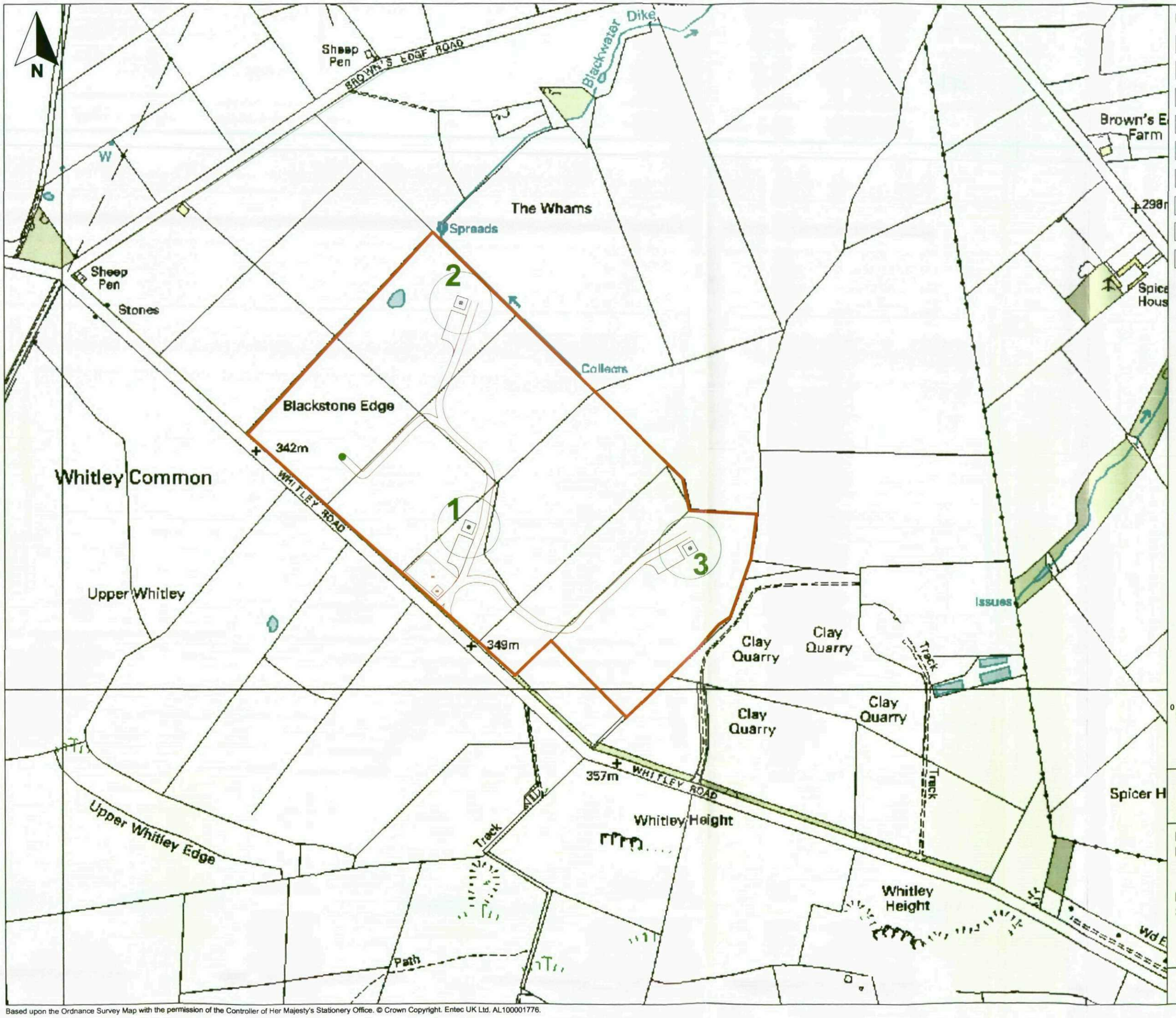
© Entec UK Limited

Consultee	Date (s) Consulted	Date (s) Responded	Response
			measures should be fully addressed in any formal application.
Barnsley Council – Landscape Team	06/11/2006	11/12/2006	Highlights some confusion of the terminology used in Table 1 regarding 'Scope of Assessment' and 'Scoped Out'.
Ministry of Defence	30/11/2005	30/3/2006 (by letter)	The MoD had no concerns with the proposal (3 turbines, 122 metres to blade tip) but any changes would require them to be notified.
National Grid Wireless	20/12/2005	21/12/2005 (by email)	The proposed site falls in an area for which Arqiva has responsibility.
NATS	30/11/2005		A standard letter was returned by NATS offering a pre-planning assessment. The assessment revealed a potential detrimental effect on the Claxby radar. As a result of this Pager Power were asked by E.ON to undertake an assessment of the likely effects of the proposed wind farm on the provision of air traffic services from NATS/NERL. This study concluded that the likelihood of NATS/NERL objecting to the proposed development is low.
Natural England	06/11/2006	11/12/2006	The EIA should identify impacts on the PRoW network in the area and consider opportunities for furthering access. The EIA should also consider increasing biodiversity and repairing the fragmentation of heathland in the area.
Ofcom	20/12/2005	31/12/2005 (by email)	Ofcom responded with a letter identifying a BT link that may be affected by the proposal.
Orange	20/12/2005	19/01/2006 (by email)	Orange had no objections.
RSPB	20/12/2005	18/04/2006 (by email)	As a rule, RSPB do not formally reply unless they have specific concerns.
T Mobile	20/12/2005	04/01/2006 (by email)	T Mobile had no objections.
YEDL	20/03/2006	03/02/2007 (by email)	Estimated works: 1 km extension of existing 11 kV line to Hazlehead substation. Estimated cost £400K.

© Entec UK Limited

www.eon-uk.com

E.ON UK plc Registered office: Westwood Way, Westwood Business Park, Coventry, CV4 8LG
Registered in England and Wales No. 2366970



Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. Entec UK Ltd. AL100001776.

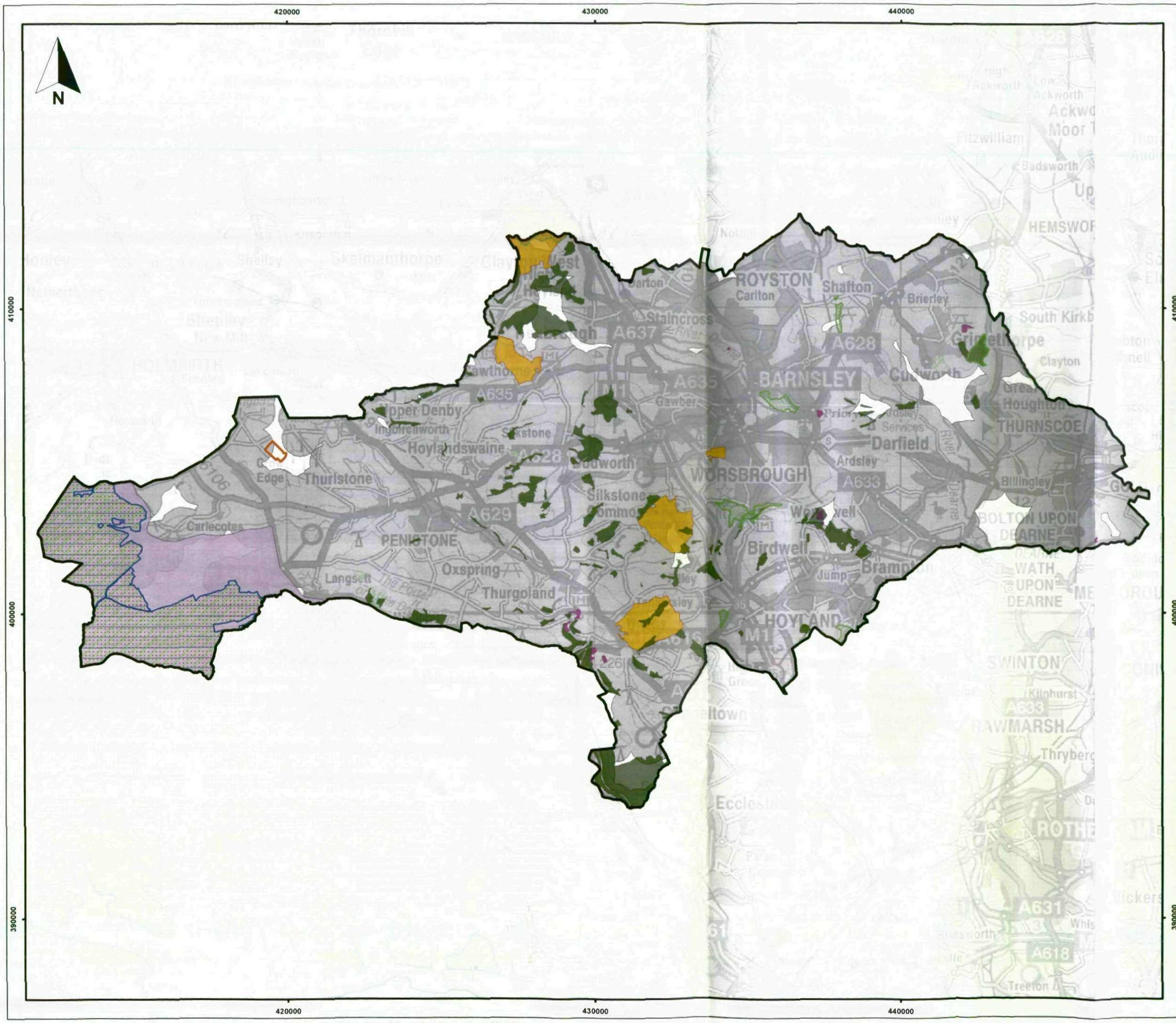
e·on

Blackstone Edge Wind Farm
Design and Access Statement

Figure 1.2
Site Layout

January 2008
19569-A38a.dwg yount

Entec



Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright 2008. AL100001776

N

Brown's Edge

Stone

GP

Spr

Sheep Pen

BROWN'S EDGE ROAD

312m

Dike

Blackwater

W

per Maythorn Farm

MAYTHORN LANE

Lower Maythorn

Sheep Pen

Sheep Pen

Stones

The Whams

Spraads

111m

43m

Collacre

Blackstone Edge

342m

WHITLEY ROAD

Whitley Common

Calf Hey Lane

Path

Upper Whitley

349m

50m

Clay Quarry

Clay Quarry

Clay Quarry

Clay Quarry

Track

Track

Lower Whitley

Upper Whitley Edge

Path

Track

357m

WHITLEY ROAD

Whitley Height

Whitley Height

Key

- Site boundary
- Preferred area for farming activity
- Conjectured fault
- Approximate location of World War II bomb decoy features
- Landfill
- Quarry
- Blackwater Dyke
- Lower Maythorn Farmhouse and Barn - Listed building
- 111m buffer from roads around the site
- 43m buffer inside the site boundary
- 50m buffer around the quarry and landfill sites
- 20m buffer around water body and Blackwater Dyke

0 m 300 m

Scale 1:5000 @ A3

e·on

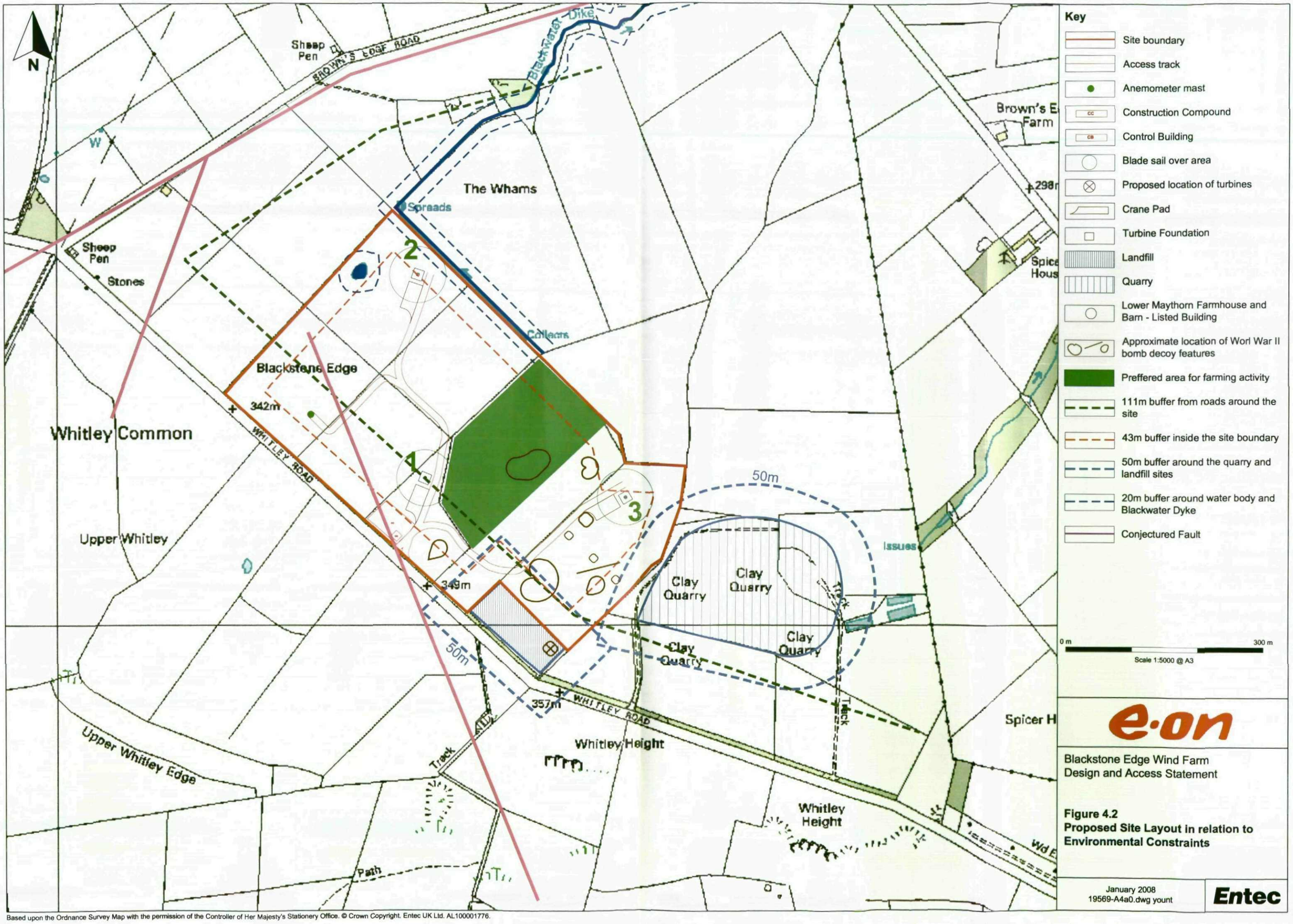
Blackstone Edge Wind Farm
Design & Access Statement

Figure 4.1
Environmental Constraints

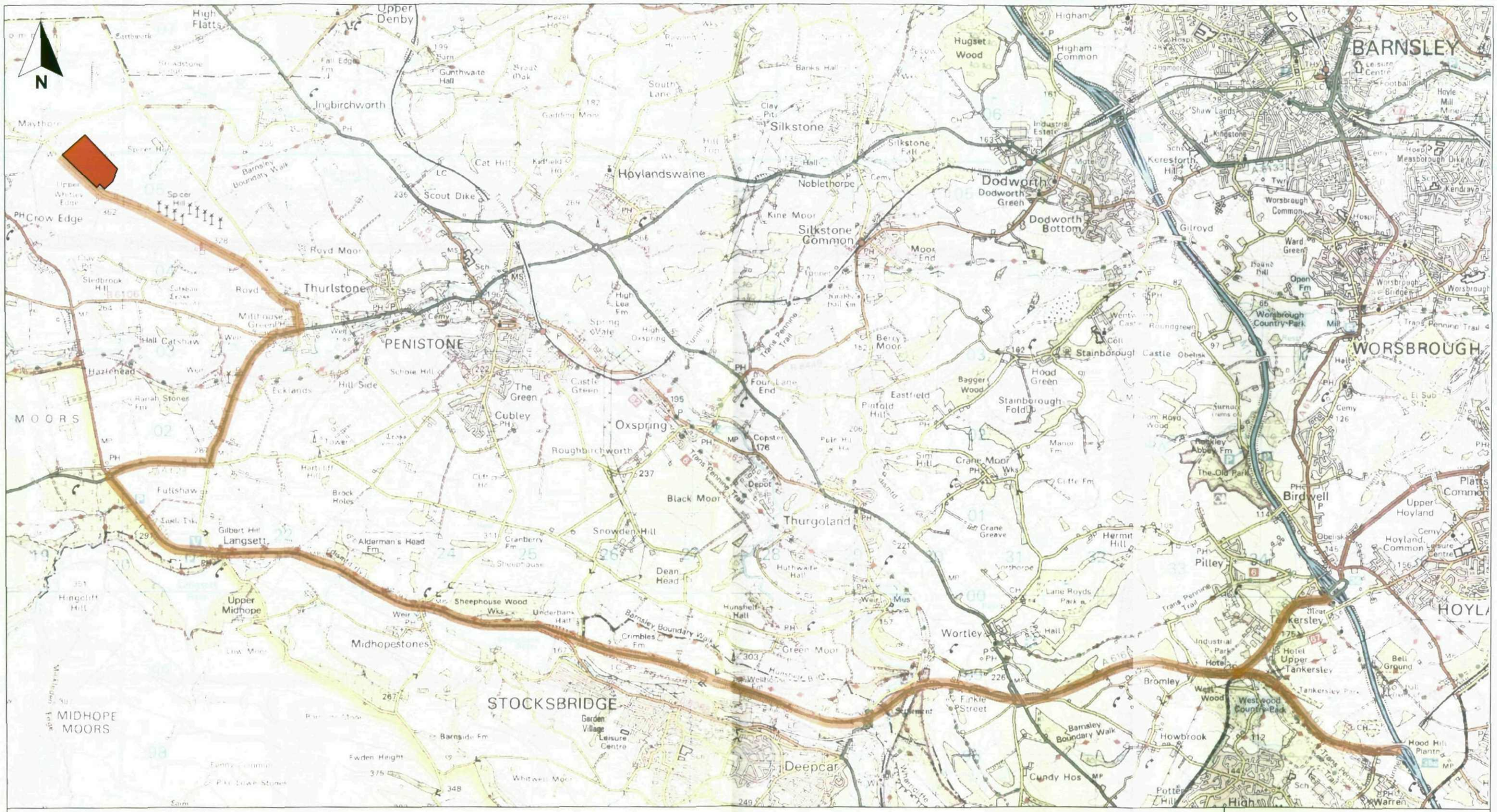
January 2008
19569-A27a.dwg bemb

Entec

Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. Entec UK Ltd. AL100001776.



Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. Entec UK Ltd. AL100001776.



Key

Site

Preferred access route

0 km 3 km

Scale 1:50,000 @ A3

e·on

Blackstone Edge Wind Farm
Design & Access Statement

Figure 5.1
Assumed Access Routes for Construction Vehicles

January 2008
19569-A29a.cdr bernb

Entec

Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty' Stationery Office © Crown Copyright. Entec UK Ltd. AL100001776