

Reeves Hill

Community Wind Energy Scheme

Environmental Statement

May 2008

**Volume 1
Non Technical Summary**

PREFACE

This Non Technical Summary (NTS) has been prepared in support of a planning application for the Reeves Hill Community Wind Energy Scheme. It presents the key findings of all the detailed environmental, ecological and technical studies that are contained within the full Environmental Statement (ES).

The Reeves Hill Community Wind Energy Scheme is proposed by Bolsterstone Innovative Energy (Reeves Hill) Ltd (BRH). This company is a project specific development vehicle formed as a partnership with Marches Green Energy Ltd (MGE). MGE was formed by two local landowners to exploit the potential wind energy of Reeves Hill in a way that has strong community involvement

BRH has accepted a legally binding commitment to community involvement through the community ownership of one of the proposed four turbines.

BRH is owned by the directors of Bolsterstone Plc, based in Chesterfield, which has varied interests including eco-friendly property development and renewable energy schemes. Bolsterstone Plc will project manage the development of the project.

The ES has been prepared and compiled by renewable energy consultancy, Dulas Ltd, following the undertaking of a full Environmental Impact Assessment (EIA) of the proposed wind farm re-powering scheme.

The EIA was assembled with the intention of conducting a thorough, objective assessment of all the environmental effects likely to arise as a result of the proposed development. The specialist advice and support was delivered by a number of independent expert consultancies, each of which has extensive experience in renewable energy planning and environmental assessments.

The ES has been prepared in four (4) volumes:

Volume 1 – This Non Technical Summary that is a summary of the information provided in the

extensive main reports, in a manner accessible to all members of the community.

Volume 2 – A Written Statement that comprises:

- An introduction and description of the Developer and the consultation process.
- The reasons for the selection of the site and a description of the proposed development.
- For each environmental issue identified through the Scoping exercise for the Environmental Impact Assessment the following is provided:
 - A description of the prevailing baseline conditions.
 - An assessment of the likely effects of Reeves Hill Community Wind Energy Scheme during construction, operation and decommissioning.
 - The measures proposed to avoid or mitigate possible adverse environmental effects.

Volume 3 – Figures that show the site location, site layout, landscape character maps, the Zone of Theoretical Visibility (ZTV), photomontages and wireframes, sites of ecological and archaeological sensitivity, and mitigation plans. In addition, project plans and schematics relating to the wind turbine types, access roads, hardstandings, substation and other civil engineering construction drawings are supplied.

Volume 4 – Appendices including supporting information relevant to the environmental assessments presented in Volume 2.

In addition to the four volume ES a Planning Appraisal has also been undertaken that examines the proposed development in the context of the requirements of the Town and Country Planning Act 1990. The appraisal takes into account:

- Local planning policies.
- Regional planning policies.

- UK Government energy and environmental policies, including international commitments to reduce greenhouse gas emissions.

On this basis, the appraisal assesses the balance between local effects and the local, national and global benefits of wind energy development. In the context of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, the Planning Appraisal does not form part of the ES.

A copy of the full ES is on display at Herefordshire Council offices (Garrick House), Leominster (Corn Square) and Kington Library. In addition, it is possible to download copies of the Non Technical Summary and some Figures are available at:

www.reeveshillwindfarm.co.uk

Forty-five (45) copies of the four volume Environmental Statement have been produced for submission with the planning application. There are a large number of copies required for the cross border consultation and stakeholders responsible for the assessment of impacts within Powys, Wales. In addition multiple copies of the ES on CD have been produced for distribution to other stakeholders and the local communities, which are available from Herefordshire Council offices or Dulas Ltd.

For further copies of the Environmental Statement (at a cost of £180) or CD copies (at a cost of £5) please contact:

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CONTENTS

1	INTRODUCTION	5
1.1	THE PROPOSAL	5
1.2	NATIONAL, REGIONAL AND LOCAL PLANNING POLICY AND GUIDANCE	6
1.3	CONSULTATIONS	8
2	ENVIRONMENTAL IMPACT ASSESSMENT	11
2.1	INTRODUCTION	11
2.2	SCOPE OF THE ASSESSMENT	11
2.3	SPECIALIST CONSULTANTS	13
2.4	SELECTION OF SITE AND THE PROJECT EVOLUTION	14
2.5	PROJECT CONSTRUCTION, OPERATION AND DECOMMISSIONING	18
2.6	LANDSCAPE AND VISUAL ASSESSMENT	20
2.7	LANDSCAPE AND VISUAL ASSESSMENT CUMULATIVE EFFECTS	23
2.8	ECOLOGICAL ASSESSMENT	23
2.9	NOISE ASSESSMENT	25
2.10	HYDROLOGICAL ASSESSMENT	25
2.11	ARCHAEOLOGICAL ASSESSMENT	25
2.12	ELECTROMAGNETIC INTERFERENCE AND AIR SAFEGUARDING	26
2.13	PUBLIC ACCESS AND SAFETY	26
2.14	SOCIO-ECONOMIC IMPACTS AND ENVIRONMENTAL BENEFITS	28
2.15	AVOIDANCE AND MITIGATION OF RESIDUAL ENVIRONMENTAL IMPACTS	30
2.16	CONCLUSIONS	32

1 INTRODUCTION

1.1 The Proposal

1.1.1 The Reeves Hill Community Wind Energy Scheme is for the installation of four (4) wind turbine generators, ancillary equipment and on site infrastructure for a period of twenty-five (25) years on land located south of the A4113 to the southeast of Knighton on the Powys/Herefordshire border. The land is currently used for arable farming and agricultural grazing.

1.1.2 The proposal is known as the Reeves Hill Community Wind Energy Scheme and its location is shown in Figure 1. The proposed wind turbine locations and associated infrastructure are shown in Figure 2. Each wind turbine would typically have a generating capacity of up to 2.3 Megawatts (MW), and would be a three-bladed design with a maximum tip height of up to 105m. It is not yet possible to stipulate a particular make and model for wind turbine as the Developer is bound to adhere to European Union procurement law for the procurement of goods and services. The final choice of wind turbine would therefore follow a competitive tendering process where qualifying wind turbines would be required to meet the standards and specifications set out within this Environmental Statement and subsequent planning conditions. Qualifying wind turbines of this capacity may have slightly differing dimensions, such as a 69m tower with a 35m blade or a 65m hub and 40m blade. The Developer is seeking planning consent for wind turbines with a maximum tip height of 105m, to encompass these minor variances across the wind turbine market.

1.1.3 An illustration of the type of wind turbine proposed is presented in Figure 3, but the assessments herein contained take account of the potential for minor variations in the dimensions of qualifying turbines. The wind turbine utilised for modelling and for the environmental assessments herein contained has a height to the centre of the nacelle of up to 69m and a rotor diameter of up to 70.5m, giving an overall height from ground to tip of up to 104.5m.

1.1.4 On the basis of 2.3MW turbines, the total installed capacity of the Reeves Hill Community Wind Energy Scheme would amount to 9.2MW. Based upon calculated wind regime for the site, this translates to approximately 24,177 Megawatt-hours (MWhr) per annum, which is equivalent to the annual average energy needs of approximately 5,144 homes (based on an average energy consumption per household of 4700 Kilowatt Hours (kWhrs) per year). The Reeves Hill Community Wind Energy Scheme would therefore provide energy equivalent to the domestic consumption of approximately 6.9% of homes in the Herefordshire County Council area which is clean, economic and renewable (based on 2001 census figures of 74,282 houses).

1.1.5 The proposed wind turbine layout is based on seeking a sustainable and practical balance between a number of factors:

- On-site turbine and infrastructure positioning constraints such as ecology, hydrology, archaeology, and separation distance from roads, households and telecommunication links;
- Minimum separation distances between turbines to avoid wind flow impacts to neighbouring turbines that may reduce performance and increase operation and maintenance costs;
- Aesthetic appearance of the turbines so that they present an appropriate design within the overall wider landscape.

1.1.6 Within the available site area, the Developer has sought to optimise the generation capacity of the site to ensure the maximum generating output, and hence optimise the contribution the site would have to national and local policy goals in respect of climate change, environmental pollution and security of energy supply. In doing so, the Developer has also sought to achieve a design that respects the local environment and delivers an overall net ecological benefit to the site through a corollary Habitat Management Plan.

1.1.7 At the substation and switchgear facility on the proposed wind farm site (see location on Figure 2) the electricity generated by the wind farm would be metered and exported to the local electricity distribution network. The connection would be the subject of a separate application under Section 37 of the Electricity Act 1989 and would be the responsibility of Central Networks. Consequently, the grid connection for the wind farm does not form part of the planning application for the Reeves Hill Community Wind Energy Scheme).

1.1.8 Land use in the surrounding area is predominantly farmland, typified by arable and agricultural grazing. There are a small number of rights of way bordering and close to the proposed site, with limited thickets of trees and hedgerows providing some landscape fabric to the area.

1.1.9 The site area forms part of a ridge line running north to south for two kilometres and peaking at a height of just over 400m. The site is located within the North West Herefordshire Hills sandwiched between the Rivers Teme and Lugg valley systems. The Herefordshire Landscape Character Assessment was published in 2002 as Supplementary Planning Guidance and was referred to as a key document in advising the production of the Unitary Development Plan. We understand that this is currently being revised and a new version should be available this year.

1.1.10 The proposed wind energy site encapsulates elements of three landscape character types (drawn from the LCA), namely Enclosed Moors and Commons, Wooded Hills and Farmland, and Principal Wooded Hills.

1.1.11 The site is not incorporated into any national or local landscape designation. Approximately 4kms to the north of the proposed site is the Shropshire Hills Area of Outstanding Natural Beauty. The Shropshire Hills were one of the first areas to be designated as an Area of Outstanding Natural Beauty in 1958 covering an area of 802 square kilometres, extending from the Wrekin to the Clun Forest and from the Stiperstones across to the Cleve Hills.

1.1.12 There are no national ecological designations in or on the edge of the proposed

development area that would be affected by a wind farm scheme.

1.1.13 Archaeologically the area is characterised by the proximity to the Welsh border to the west and the associated feature of Offa's Dyke. Locally there are remains of quarry activity and pillow mounds dated to the post Medieval period.

1.1.14 During construction contracts equal to approximately £2 million would be available by competitive tender to regional construction companies.

1.1.15 Through the lifetime of the project the Developer will offer an annual payment to a community fund. There will also be the opportunity for individuals to invest in the project.

1.1.16 The operating lifetime of the project will represent an ongoing investment into the local economy through rents, rates and employment for local servicing and site maintenance staff.

1.2 National, Regional and Local Planning Policy and Guidance

1.2.1 The proposal will make a useful contribution to the reduction of greenhouse gas emissions to the atmosphere, which are scientifically accepted to be a major contributor to human induced climate change now identified as the biggest threat to our planet.

1.2.2 The proposal will also make a significant contribution to local electrical energy needs reducing our reliance on imported fossil fuels and hence increasing the security of our supply.

1.2.3 The potential wind energy scheme, if consented, will constitute a commitment by Herefordshire Council to the attainment of national and regional renewable energy targets for the United Kingdom. Such benefits are now established by Planning Policy Statement 22: Renewable Energy (2004), the subsequent Energy Review (2006) and the resulting Energy White Paper (2007). These national policy documents are material considerations in any planning application for renewable energy projects and should be considered by the local

planning authority when determining such an application.

1.2.4 The recent Energy White Paper (May 2007) sets out the Statement of National Need for Renewable Energy and emphasises the following:

New renewable projects may not always appear to convey any particular local benefit, but they provide crucial national benefits. Individual renewable projects are part of a growing proportion of low-carbon generation that provides benefits shared by all communities both through reduced emissions and more diverse supplies of energy, which helps the reliability of our supplies. This factor is a material consideration to which all participants in the planning system should give significant weight when considering renewable proposals ... The benefits to society and the wider economy as a whole are significant and this must be reflected in the weight given to these considerations by decision makers in reaching their decisions

1.2.5 Clearly, the above Statement of National Need has to be balanced in the development control process against the need to ensure proposals accord with local development plan guidance and with national legislation for the protection of natural resources and assets.

1.2.6 The supplement to Planning Policy Statement 1 'Delivering Sustainable Development' was released at the end of 2007 and places the issue of climate change centrally within National Planning Guidance statements. In terms of contribution to climate change targets, the document removes the requirement for developers to justify the need for renewable energy projects. The lead statement under the Key Planning Objectives indicates that:

Regional planning bodies and all planning authorities should prepare and deliver spatial strategies that:

make a full contribution to delivering the Government's Climate Change Programme and energy policies, and in doing so contribute to global sustainability

1.2.7 The document is a material

consideration in the evaluation of planning applications. Given its national status, this document thus takes precedence over references to renewable energy within current local authority development plans, and must be incorporated in any emerging local development plan documents. If they have not done so already, it is therefore the responsibility of the local authority to assess the area's potential for accommodating renewable and low carbon technologies. Planning authorities are required:

In developing the core strategy, and their approach to site allocation to pay particular attention to opportunities for utilizing and expanding existing decentralised energy supply systems, and fostering the development of new opportunities for decentralized energy from renewable and low-carbon energy sources to supply proposed and existing development;

consider allocating sites for renewable and low-carbon energy sources, and supporting infrastructure, taking care to avoid stifling innovation;

look favourably on proposals for renewable energy, including on sites not identified in development plan documents;

not require Developers to demonstrate either the overall need for renewable energy and distribution or for a particular proposal for renewable energy to be sited in a particular location;

avoid policies that set stringent requirements for minimising impact on landscape and townscape if these effectively preclude the supply of certain types of renewable energy, and therefore other than in the most exceptional circumstances such as within nationally recognised designations, avoid such restrictive policies;

1.2.8 The draft Regional Spatial Strategy (RSS) replaces the former Regional Planning Guidance 11 for the West Midlands. Within the RSS policy EN1: Energy Generation, criteria for determining the acceptability of proposals are highlighted in sub-section (iii), as follows:

iii) identify the environmental and other criteria that will be applied to determining the acceptability of such proposals including:

a) impact on the landscape, visual amenity and areas of ecological or historic importance;

b) impact on surrounding residents and other occupiers;

c) traffic implications, and proximity to transport infrastructure;

d) the environmental impact of any additional transmission requirements;

e) the extent to which the proposal helps to achieve wider environmental benefits such as reducing harmful emissions to the atmosphere;

f) the way in which the proposal assists in achieving national targets of new electricity generating capacity from renewable energy sources;

g) the extent to which there has been community involvement in developing the proposal; and

h) the extent to which the proposal supports other policies in the development plan

1.2.9 The draft RSS also instructs local planning authorities to provide locational guidance for development proposals via Supplementary Planning Guidance (SPG), including locational guidance. No such SPG has yet emerged from Herefordshire Council.

1.2.10 The Unitary Development Plan for Herefordshire (2007) refers to locational guidance in respect of renewable energy in Policy CF4. The policy advises that development proposals should avoid areas of international importance for nature conservation (SPAs, SACs, Ramsar) and that the Council will not compromise on proposals that may affect SSSIs, NNRs, SAMs and the Malvern Hills and Wye Valley AONB.

1.2.11 The policy further states that for development proposals outside of nationally designated areas there should be no significant

detrimental effect on landscape character. The policy also seeks to protect the amenity of neighbouring properties to proposed developments.

1.3 Consultations

1.3.1 Statutory and Non-Statutory Consultations

1.3.1.1 The following consultees have been approached for information and guidance throughout the process of the EIA in the course of the preparation of the ES:

- Herefordshire Council – planning, ecology, archaeology, environmental health, Highways, rights of way
- Powys County Council
- RSPB
- Natural England
- Health and Safety Executive
- Shropshire County Council
- Herefordshire Wildlife Trust
- Environment Agency
- English Heritage
- CPRE Herefordshire
- Shropshire Hill AONB Partnership
- Central Networks
- Severn Trent Water
- Wales and West Utilities
- CCW

1.3.1.2 The Developer has also endeavoured to ensure that local organisations and councils likely to have an interest in the proposed scheme have been kept informed on developments. These include:

- Border Group Parish Council
- Prestigne Town Council
- Knighton Town Council
- The Spaceguard Centre, Powys Observatory
- Herefordshire Bat Group

- Herefordshire Ornithological Club

1.3.1.3 Specific air safeguarding and electromagnetic interference consultations were undertaken with the following bodies:

- Ministry of Defence
- National Air Traffic Services
- Civil Aviation Authority
- Ofcom
- National Grid Wireless (Formerly Crown Castle)
- BBC Research and Development
- O2
- Arqiva (formerly NTL)
- British Telecom
- T Mobile
- Vodafone
- Orange
- Cable and Wireless
- CSS Spectrum Management Services Ltd
- JRC (Joint Radio Company JRC (Joint Radio Company)

1.3.2 Public Consultation

1.3.2.1 In addition to the consultations with the planning authority and the statutory consultees, consultations with the general public in the area have been undertaken by the Developer in a thorough and exemplary manner and these have included:

- Presentations
- Newsletters
- Website
- Exhibitions
- Press Releases

1.3.2.2 During the development of the Reeves Hill Community Wind Energy Scheme the Developer has committed to maximising public knowledge and discussion of the proposal. The Developer has instructed Dulas Ltd to engage in full public debate and information exchange on

the scheme, and the Developer itself has committed to the preparation and issue of a considerable volume of publicity materials and awareness raising. The approach taken by the Developer, in the opinion of Dulas Ltd, strongly embraces the recommended consultation and awareness activities cited in the South West Public Engagement Protocol for Wind Energy issued in September 2005. Consequently a Statement of Community Involvement has been submitted alongside the planning application.

1.3.2.3 A presentation by Dulas Ltd on wind energy and the potential wind farm at Reeves Hill followed a request for information by the Border Group Parish Council. The presentation was made on 28th November 2007 and included representatives of Prestigne Town Council. The presentation was fully attended. An explanation of why renewable energy is required, how wind energy works, and the potential components of a wind energy scheme on Reeves Hill was made, followed by a question and answer session.

1.3.2.4 Relevant information on the community wind energy scheme has been published through a project specific website located at www.reeveshillwindfarm.co.uk and prepared by the Developer. This site provides relevant information on the proposal, and importantly provides a feedback mechanism directly to the Developer so that the public can put their views directly to the Developer.

1.3.2.5 A community newsletter was prepared and issued by the Developer on 17th March 2008. This newsletter was issued to 5,144 residential properties in the area covered by the Border Group and Stapleton Group Parish Councils, together with homes in Presteign and Knighton. Again, information on the Developer, the proposed scheme, and related climate change issues was presented, along with details of the website and contact details for the public to get in contact with the Developer and express their views on the proposed scheme.

1.3.2.6 Pre submission public exhibitions were held at Lingen Village Hall on the 27th March, Knighton Community Centre on the 28th March and at the Assembly Rooms in Presteigne on the 29th March 2008. The purpose of the public exhibitions was to introduce the potential scheme, to seek an understanding of the issues that were a concern to local residents, to discuss the draft plans at that stage, and to consider any recommended issues or comments in the

finalisation of the layout of the proposed community wind energy scheme. The exhibition allowed the Developer to consider any recommended issues or comments in the finalised layout of the proposed wind farm.

1.3.2.7 The Developer undertook considerable effort to attract people to the exhibitions by the breadth of its publicity:

- Press releases to local media
- Newsletters to local residents as set out in sub-section 1.3.2.5
- Mailshot to local councilors, MPs and MEPs

1.3.2.8 It has been estimated that approximately 350 people attended the exhibitions.

1.3.2.9 In total 65 questionnaire forms were filled and returned. The questions focussed on the technology of wind energy to enable the comments to be given context. On the question 'do you support our proposal for the wind farm', 47% expressed support, 35% did not support and 18% were unsure. The opportunity to leave comments resulted in 28 comments being submitted. Of those, 11 comments held personal views rejecting both wind power in general and the Reeves Hill proposal specifically.

1.3.2.10 The main questions or issues raised by those persons attending the exhibitions centred on the following broad areas:

- Noise – apprehensive about noise.
- Intermittency – are wind farms reliable generators and is conventional back up still required?
- Tourism – will the wind farm affect the numbers of tourists that come to the area?
- Visuals – what would the wind farm look like from their property?
- Landscape – ruination of the beautiful landscape
- Electricity Generation – what would be the output of the scheme, how many homes would this be equivalent to, and would the electricity be exported from the area?

- Proliferation of wind farms – will there be other wind farms in the area through the same developer?
- Transport – how will construction vehicles get to the site?
- Subsidies – is the wind energy industry subsidised?

1.3.2.11 The Developer has sought to address these issues by commissioning Dulas Ltd to ensure that such issues are considered and assessed in an Environmental Statement. Where issues have not been addressed, both in terms of Scoping responses and public requests, the individual assessments explain why this is so.

1.3.2.12 During the development of the scheme and following the public exhibitions, at which attendees were given the opportunity for requesting further additional information if required, a number of consultations with residents in the area have taken place. These have included:

- Early stage discussions with Jonathon Tate of the Knighton Spaceguard Centre to establish if there are concerns regarding potential impacts to their operations.
- Local residents on matters of noise impact.
- Post Exhibition questions answered specific to house locations on visual issues, noise as well as more general issues.

2 ENVIRONMENTAL IMPACT ASSESSMENT

2.1 Introduction

2.1.1 The Developer appointed UK based renewable energy consultancy Dulas Ltd to undertake an iterative wind farm re-power design and layout process incorporating the current wind farm infrastructure, maximisation of the energy capture of the site's wind resource, and informed by the findings of the environmental impact assessment.

2.1.2 Dulas is a renewable energy consultancy, established in mid Wales in 1982, with experience of over 60 planning applications and environmental statements for renewable energy projects resulting in the consenting of over 235MW. Dulas has a firm belief in designing and delivering sustainable energy projects that maximise benefits and reduce residual impacts to acceptable levels. It is highly competent, as a company, in its understanding of renewable energy technologies, relevant regulatory controls and planning policy guidance, and specific development control matters.

2.1.3 This Non Technical Summary (NTS) and the full Environmental Statement (ES) have been prepared by Dulas Ltd to accompany the planning application by the Developer to Herefordshire Council (HC) under the Town and County Planning Act 1990.

2.1.4 The full ES presents the information that will enable HC, Statutory Consultees, non statutory interest parties and members of the public to assess in full the environmental effects and benefits of the Reeves Hill Community Wind Energy Scheme proposal. It has been prepared in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (Statutory Instrument 1999 No. 293).

2.1.5 Statutory Instrument No. 293 in Part II (1) defines an Environmental Statement as a document:

“(a) that includes such of the information referred to in Part I of Schedule 4 as is

reasonably required to assess the environmental effects of the development and which the Developer can, having regard in particular to current knowledge and methods of assessment, reasonably required to compile, but

(b) that includes at least the information referred to in Part II of Schedule 4.”

2.1.6 It is noted that presently consultation papers have been issued by the Department for Communities and Local Government that are relevant to this proposal. These papers include the 'Amended Circular on Environmental Impact Assessment' and 'Environmental Impact Assessment: A guide to good practise and procedures'. The former document, as well as providing prescriptive guidance on screening, scoping, submission procedures and establishing the adequacy of the information provided, presents in Annex C a guide to information to be included in an Environmental Statement, which is relevant to this proposal. The latter document provides guidance to those developments that seek consent through the Town and Country Planning system, also relevant to this proposal.

2.1.7 Further guidance on changes to the development control system, issued again by the Department for Communities and Local Government, has been reviewed, particularly in respect of the requirement for design and access statements to accompany planning applications. Such a statement will accompany the planning application for this proposal.

2.2 Scope of the Assessment

2.2.1 A formal scoping meeting was held at the Herefordshire Council offices on the 5th September 2007, to which representatives of the Council, Powys County Council, Natural England, the Herefordshire Wildlife Trust, RSPB, English Heritage and other consultees were invited. Only the Herefordshire Council representative chose to attend. The purpose of the Scoping meeting was to facilitate the formulation of a formal Scoping Opinion by Herefordshire Council as required under Part IV of Statutory Instrument 1999 No. 293. The

formal Scoping Opinion of Herefordshire Council was subsequently issued in October 2007. Some Statutory Consultees and Non-Statutory Consultees listed in sub-Section 1.3 provided their inputs through written responses, as follows:

- RSPB
- Natural England
- Powys County Council
- Shropshire County Council
- Herefordshire Wildlife Trust
- Environment Agency
- English Heritage

2.2.2 In fulfilment of the Scoping Opinion and the obligation to conduct an Environmental Impact Assessment, the ES sets out to:

- Explain the process of re-powering the Reeves Hill Community Wind Energy Scheme site, and justify the utilization of the site and its components in light of national, regional and local planning policy guidance.
- Describe the physical characteristics of the proposed wind turbines, their land use requirements during construction, operation and decommissioning, and the associated ancillary infrastructure required for establishment and operation of the site.
- Describe the existing environmental character of the application site and the surrounding area in respect of the environmental attributes likely to be affected by the proposal.
- Assess and predict the possible environmental effects of the wind turbines and associated infrastructure.
- Describe the measures which will be taken, or have been incorporated at the design stage, to avoid, offset, reduce or remedy any significant adverse environmental effects.
- Provide NCDC and consultees with sufficient information to help them come to a decision on the planning

application for the proposed Reeves Hill Community Wind Energy Scheme.

- Provide the public with detailed information on the proposal and how it will affect their locality, to enable them to formulate their opinion on the proposal and submit their responses to Herefordshire Council.

2.2.3 In respect of the Scoping exercise and the Parts cited above, the Scope of the ES has been developed in the context of Local, Regional and National planning policies, in consultation with the planning officers of Herefordshire Council, and with respect to the comments received from Statutory Consultees and non-statutory consultees.

2.2.4 In addition to the above, a letter from HC on 5th October 2007 (confirming the scope of works) requested consideration of the following further matters:

- The elements 1-4 of Schedule 4, Part I of Statutory Instrument 1999 No. 293.
- Specifically the assessment work should address specific impacts in the subject areas of:
 - Traffic
 - Ecology
 - Groundwater
 - Mitigation
 - Sensitive, designated sites
 - Visual impact
 - Public rights of Way
 - Noise
 - Powys observatory
 - Decommissioning
 - EMI conflicts

2.2.5 On this basis, the main issues considered in the ES are:

- Selection of the site and project evolution;
- construction, operation and decommissioning of the wind farm;
- landscape and visibility;

- noise;
- ecology, including ornithology;
- archaeology, including cultural heritage;
- air safeguarding and electro-magnetic interference (EMI);
- ground water protection;
- public and private safety, including rights of way;
- socio-economic effects and global environmental benefits;
- impact avoidance and mitigation measures.

Kington
Herefordshire
HR5 3BE

Archaeological and Cultural Heritage Assessment

Clwyd Powys Archaeological Trust (CPAT)
20 High Street
Welshpool
Powys
SY21 7JP

Photomontages and Wireframes

Phil Marsh Associates
5b Hope Bowdler
Church Stretton
Shropshire
SY6 7DD

2.3 Specialist Consultants

2.3.1 The Environmental Impact Assessment team has been assembled with the intention of conducting a thorough, objective assessment of all the environmental effects likely to arise as a result of the proposed development. The specialist advice and support was delivered by the following external, independent consultancies, each of which also has extensive experience in renewable energy planning and environmental assessments:

Civils and Hydrology

Scott Wilson
3rd Floor
Mayflower House
Armada Way
Plymouth
PL1 1LD

Landscape and Visual Assessment (LVA)

Anne Priscott Associates
The Old Bakehouse
Corfe
Taunton
Somerset
TA3 7AJ

Transport Access Analysis

R Collett & Sons (Transport) Ltd
Victoria Terminal
Albert Road
Halifax
HX2 0DF

Noise Assessment

Hayes Mackenzie Partnership
Lodge Park
Tre'r ddol
Machynlleth
Powys
SY20 8PL

Planning Appraisal

David Stewart Associates
Selgars House
Uffculme
Cullompton
Devon
EX15 3DA

Ecological Assessment

Dr R Widdicombe
Border Ecology
27 Church Street

2.4 Selection of Site and the Project Evolution

2.4.1 The nature of the development, falling under Annex II of the Environmental Impact Assessment (EIA) Directive (97/11/EC), requires that the site selection process is followed. The turbine type, layout and number will change from the current operational site, and therefore the associated environmental costs and benefits of the site will also differ.

2.4.2 The selection of a site for a wind power project is a complex process. It involves the assessment of a number of technical, commercial, environmental and planning criteria.

2.4.3 National, regional and local planning policy guidance has been reviewed and the proposal does not obviously conflict with policy.

2.4.4 In addition other factors such as ecological designations (Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest), avoidance of urban areas and need to identify areas unconstrained by properties to achieve noise limits, transport access arteries, and grid connection infrastructure, are all accounted for in the identification of suitable sites for wind energy development.

2.4.5 Two reviews of the availability of suitable land for wind energy schemes have been undertaken in the lead up to this project. Firstly, the Developer undertook its own site finding exercise in Herefordshire, as described above.

2.4.6 Secondly, Dulas actually undertook a resource constraints mapping exercise of Herefordshire for another wind farm developer in 2005. The methodology employed and the results are presented below.

2.4.7 In 2005, Dulas was commissioned to identify potential wind farm sites in Herefordshire for a wind farm developer. The detailed results of this exercise are not reported here, due to commercial confidentiality as the search was conducted for another client, but Dulas' overall understanding of potential development for wind energy in Herefordshire

can be presented. Extensive use of Geographical Information Systems (GIS), planning policy guidance reviews and site visits were undertaken to identify potential sites. Particular attention was given to International planning designations (e.g. RAMSARs), National designations (e.g. AONB, Heritage Coast) and Local designations, and a review of County Structure plans.

2.4.8 Technical constraints were also addressed, including Electromagnetic Interference (EMI), aeronautical interests such as radar and air traffic control, and existing wind energy projects. Further technical constraints, which have little or no implication on the planning process, but will have an effect on the viability of developments, including the local proximity of the electricity distribution network and windspeeds, were also examined.

2.4.9 Among the barriers to wind energy development in Herefordshire are the following constraints, many of which are absolute constraints that would prevent wind farm development:

- Malvern Hill and Wye Valley AONB
- Sporadic international and national ecological designations, such as SACs, SSSIs, NNRs
- Access difficulties to remote areas of the County off the main A road network. Wind turbines are more likely to be sited in rural areas, but the road network presents considerable challenges in terms of getting turbine components to potential sites. In addition, there are numerous bridges in the County that are not capable of supporting the turbine delivery loads required for wind farms.
- Sporadic residential properties – the County is peppered with properties in the rural areas. This curtails the potential for viable wind energy schemes due to the difficulty of protecting the noise and amenity of residences.
- Low wind speed – the Herefordshire Plain is low lying and in the lee of the Welsh borders and the Black Mountains. Wind speeds in this area are low and not expected to support wind energy schemes unless turbine hub heights well

in excess of 100 metres are found acceptable.

- Clee Hill radar, which prohibits potential developments in the north and north east of the County.
- Weak grid infrastructure which would require considerable and uneconomic strengthening by developers to enable wind energy schemes to connect.

2.4.10 Herefordshire is a county that has considerable constraints to wind energy schemes, which accounts for the lack of development to date and the paucity of schemes being investigated currently by wind energy developers

2.4.11 As a result of the site selection and re-evaluation process employed by Dulas it was re-established that the site of the Reeves Hill Community Wind Energy Scheme proposal is one of the viable areas in Herefordshire for wind farm development.

2.4.12 The following technical criteria were also considered in the selection of the Reeves Hill Community Wind Energy Scheme site. These have little or no implications for the planning process but have an effect on the technical viability of developments.

2.4.13 Electrical Connection

2.4.13.1 The local distribution network in the vicinity of Reeves Hill provides limited potential for 11kV and 66kV connection options.

2.4.13.2 Preliminary feasibility studies have established that the likely grid connection options would be:

- To connect to a single T-pole via an underground cable into the 66kv overhead line that passes across the lane adjacent to Greenway Farm
- To connect to Knighton substation, approximately 3km north-west of the proposed wind farm site, via a new 11kv underground line.

2.4.14 Wind Resource

2.4.14.1 Two indications of the available wind resource on Reeves Hill can be cited here.

Firstly, original wind resource monitoring of the site was undertaken in 1994/1995 when a wind monitoring mast was erected. The data from 12 months of monitoring was analysed by Garrad Hassan. The wind resource analysis concluded that wind speeds of 6.4 metres per second would be expected at 34.5 m hub height, and 6.5 m/s at a 41.3 m hub height. If these figures were to be extrapolated to the proposed hub height for this revised scheme (69m), a wind speed equal to 7 m/s would be expected on Reeves Hill.

2.4.14.2 Secondly, the Department of Trade and Industry wind speed database (ETSU NOABL) contains estimates of the annual mean wind speed throughout the UK. The data is the result of an air flow model that estimates the effect of topography on wind speed. There is no allowance for the effect of local thermally driven winds such as sea breezes or mountain/valley breezes. The model was applied with 1km square resolution and makes no allowance for topography on a small scale or local surface roughness (such as tall crops, stone walls, or trees), both of which may have a considerable effect on the wind speed. The data can only be used as a guide and should be followed by on-site measurements for a proper assessment.

2.4.14.3 Each value stored in the NOABL database is the estimated average for a 1km square at options of 10m, 25m or 45m above ground level (agl). The database uses the Ordnance Survey grid system for both Great Britain and Northern Ireland.

2.4.14.4 Investigation of the NOABL database provided a preliminary confirmation that there are high enough wind speeds at the site to generate electricity economically.

2.4.14.5 Whilst the economic viability of the site based on the available wind resource is largely a matter for the Developer, the NOABL reading for the site (NGR SO3168) is 7.4 m/s at a 45 metre hub height. This windspeed, if modelled upwards to the proposed 69m hub height of the Reeves Hill turbines, clearly exhibits that a viable wind resource is available for effective operation and performance of the wind farm site. Typically, wind energy developers seek sites with a minimum 6 metres per second wind speed in order to ensure the economic viability of a wind farm. The Reeves Hill site is clearly in exceedance of this figure.

2.4.15 Wind Turbine Spacing and Separation Distances

2.4.15.1 Firstly, it should be noted that at a generic level wind farms are expected to preserve local amenity, particularly in respect of noise and visual dominance. Consequently, the Developer has adopted a 600 metre separation distance from any properties in the vicinity of the wind farm..

2.4.15.2 Further, the Developer has applied a separation distance between the wind turbines equal to six times the rotor diameter in the predominant wind direction. This separation distance is reduced to four times the rotor diameter across the predominant wind direction. Such a spacing protocol creates an oval shape around the wind turbines. The reason for this is to protect turbines from the localised wake and turbulence effects caused by other wind turbines in the wind farm.

2.4.16 Noise

2.4.16.1 The permissible noise thresholds set within ETSU-R-97 are the governing guidelines on acceptable noise levels from wind turbines to residential properties. ETSU-R-97 recommends that day time noise from wind farms should be limited to 5 dB(A) above the prevailing background or a fixed maximum within the range 35-40 dB(A), whichever is the higher. The night time periods are 5 dB(A) above prevailing or a maximum of 43 dB(A), whichever is higher. This is the standard methodology, endorsed by PPS22, for the undertaking of noise impact assessments for wind farms.

2.4.16.2 Due to the requirement to achieve compliance with the acceptable noise thresholds stated in ETSU, changes to the wind farm layout based on the options for choice of size of wind turbine has been a major constraint on the positions of the turbines.

2.4.16.3 Throughout all the iterations to the layout of the Reeves Hill Community Wind Energy Scheme potential noise effects have been assessed in conjunction with the specialist noise consultant Hayes-McKenzie Partnership Ltd. This informed the Developer on the suitability of the new wind turbine locations in terms of preventing any potential noise nuisance.

2.4.17 Final Layout Design

2.4.17.1 There have been six layout iterations for the wind farm turbines and infrastructure proposed at different stages of site development as a result of on site constraints. The 4 layouts resulting from these iterations are presented under Appendix 2, Volume 4. Details of the changes are as follows:

Wind Resource Distribution and Noise

2.4.17.2 The first layout (Appendix 2) sought to maximize wind capture by considering a larger area to include land to the east of the current site boundary, thereby increasing the potential to maximize spacing between turbines and thereby improve on site generation through the avoidance of wake effects. This first layout was modelled from a noise perspective but it clearly exceeded threshold levels at nearby properties. This excluded the possibility of subsequent layouts stretching to the east from the current proposed locations.

Noise constraints

2.4.17.3 The second iteration (Appendix 2) proposed a layout of 5 turbines moved into a line reflecting the main ridge of Reeves Hill and Stonewall Hill. The layout of five turbines is the maximum possible number of turbines of the proposed scale for the site area by still maintaining a 500m buffer zone around turbines to nearest occupied property. The layout was presented to Herefordshire Council to determine the scope of Environmental Impact Assessment that was required.

Onsite safe separation distances - Boundary, Highway and Bridleway constraints

2.4.17.4 The third layout change reduced the scheme to a layout of 4 turbines due to the need to achieve acceptable distances from the public highway and bridleway. The purpose here is to achieve the recommended safety fall over distance as recommended by PPS22.

2.4.17.5 A bridleway that (WE 15) is routed to the north of most northerly turbine, running for approximately 850m between two C class roads and is not continuous beyond these road on either side. A separation distance of tip height plus 10% (115m) has been achieved, actually greater than the PPS22 recommended fallover distance from the public highway that the

bridleway connects.

2.4.17.6 The discussion with the council over the suitability of 115m as a separation distance is recorded within Appendix 17, Volume 4. The separation distance of 115m would not conform to the non-peer reviewed aspirational guidance of the British Horse Society (BHS) which recommends a 200m separation distance to turbine bases (see section 2.4.3.4).

2.4.17.7 However, given the location, connecting two minor roads, the same separation distance from those roads has been adopted. There is significant opportunity for horses to view turbines on the approach road from both north and south. There is no conclusive evidence of horse scare by wind turbines as is evidenced in section 11, volume 2 of this written statement.

Onsite archaeological constraints

2.4.17.8 The fourth layout was further constrained by recorded archaeological features presented on Figure 30, Volume 3 to the south of the site on Stonewall Hill.. These features, whilst of low archaeological merit (see the archaeological assessment, section 8 of this written statement) are avoided by the positioning of access tracks.

Onsite ecological constraints

2.4.17.9 The fifth layout iteration was finally constrained by ecological habitats presented by the plantations and stands of trees located adjacent to the site area. The separation distance adopted to avoid oversail by turbine blades of the northerly turbine (T1) required a 50m separation from the plantation forestry at the northern end of the site area. (see Figure 4, Volume 3)

Visual Distribution of Turbines

2.4.17.10 The sixth layout iteration finalized the layout of four turbines and moved the northerly turbine further to the south by around 100m to prevent visual dominance to properties to the north.

Final Layout Design

2.4.17.11 The final layout of the Reeves Hill proposal has taken account of the known constraints discussed above in the siting of wind farm infrastructure. Through avoidance of these

known constraints, significant impacts to the environmental attributes of the site have been prevented. Minor residual impacts may still arise, proposals for the mitigation for which are presented in Section 12 of this Written Statement.

2.4.17.12 From a landscape and visual perspective, a detailed landscape character assessment has been undertaken by CCW as LANDMAP in Wales and by Herefordshire and Shropshire Councils, including all of the study area, and by the author of the LVA of the site, which formed the baseline against which the magnitudes of change, sensitivity of receiving landscape and visual receptors have been assessed. The English approach to assessing the landscape was also carried over into the Welsh part of the study area for consistency of assessment. It has assisted in the judgement that the changes likely to occur will bring about a change in the local landscape character. This change will be broadly perceived to have an effect on the landscape of the undulating ridge within the Enclosed Moors and Commons on which the site sits.

2.4.17.13 It has been concluded that the development relates well to the receiving landscape character of the site and the perception of the landscape. A development of this nature in this location will not adversely detract from the sub-regional landscape character or the diversity of landscape character beyond the local context

2.4.17.14 The final layout of the four new turbines on the Reeves Hill Community Wind Energy Scheme proposal has taken account of the known constraints discussed above in the siting of wind farm infrastructure. Through avoidance of these known constraints, significant environmental impacts to the site have been prevented or mitigated.

2.4.17.15 The site selection process itself is probably the most important avoidance and mitigation tool in developing renewable energy proposals. In this way significant effects to nationally important resources and technical features are avoided, leaving residual impacts to local resources and features to be mitigated.

2.4.17.16 Where negative impacts to the environment have been identified in the

assessment processes presented in the ES, recommendations have been put forward which are designed to mitigate such impacts. The expectation would be that where these mitigation measures are incorporated into the final development, construction, operation and decommissioning of the wind farm proposal they would lead to residual impacts that would be acceptable.

2.5 Project Construction, Operation and Decommissioning

2.5.1 Following are details of the construction programme, methodology, site requirements, construction materials, temporary works and highways considerations. It also includes an assessment of the potential impacts of construction and operational traffic and vehicle access to the site.

2.5.2 The construction period will last approximately 4-6 months.

2.5.3 Depending on the final design, which is subject to detailed, location-specific site investigations, each wind turbine foundation may require up to 277.7 m³ of concrete, which would include about 44.7 tonnes of steel reinforcing. This would amount to approximately 1,110.8 m³ of concrete and 178.8 tonnes of steel for all of the turbines. Each foundation would also require a quantity of plastic ducting, shuttering and drainage materials. Copper earthing cables would be laid beneath a layer of blinding cement under each foundation.

2.5.4 Construction

Wind Turbine Design and Turbine foundations

2.5.4.1 The application is for 4 turbines of 105m to tip height. The tip height and the lengths of the tower and blades may marginally vary dependent on available machines on the market at the time of construction. The towers and blades would probably be finished in an off-grey colour although the final colour specification would be decided in conjunction with the local planning authority.

2.5.4.2 The foundation construction will require excavation to approximately 3m, meeting the bedrock to be levelled off and 'blinded' prior to the in-situ casting of the steel-reinforced concrete slab that would measure approximately 15m across; dependent on final turbine selection.

Public Highway Considerations

2.5.4.3 Site access is a major determinant in the siting of wind farms. The large structures require suitable access conditions and whilst minor changes to road systems can be made to improve access, major changes usually cannot be undertaken due to the prohibitive cost of such works and the inconvenience to the road network. In the case of the Reeves Hill Community Wind Energy Scheme proposal, the Developer has established that there is a suitable road network in place for the delivery and construction of wind turbines.

2.5.4.4 It is expected that turbine components would be delivered to Ellesmere Port and routed via the Shrewsbury ring road. From the A5 at Shrewsbury, vehicles would turn onto the A49 to Ludlow.

2.5.4.5 At Ludlow turbine component vehicles would turn right onto the A4113 to Knighton. On the outskirts of Knighton, the vehicles would turn up onto the Llanshay Lane and carry up on to site. The distance of the overall route would be approximately 150 km. Minor road modifications and temporary removal of street furniture will be required to ensure adequate access conditions approaching the junction leading to site and as informed by an evaluation of the route by Collett Transport Ltd, a specialist haulage contractor.

2.5.4.6 The required access route from the A4113 to link up with the Llanshay Lane is the subject of a separate planning application to Powys County Council.

2.5.4.7 Where minor modifications are required, such as the temporary removal or relocation of street furniture, these will be undertaken at the Developer's expense and agreed with the competent Highways authority in accordance with their requirements.

2.5.4.8 The minor road on which the accesses are to be formed is not a through route and

appears to serve the local farming community. On the day of the survey, in the 2½ hour period between 10am and 12.30pm, 12 cars, 1 light van and 1 HGV were observed – approximately 1 vehicle every 10 minutes. It is reasonable to assume that this is representative of the lightly trafficked nature of the road. To the north of the site the ‘Spaceguard Centre’ tourist attraction is likely to increase traffic volumes between it and the A4113.

2.5.4.9 In the vicinity of the site the carriageway is approximately 3.0m wide, i.e. is single track. There is no indication of serious over-running of the grass verges and this suggests that the road accommodates the low flow of traffic with passing where necessary taking place at junctions or hardened gateways.

On-site Access

2.5.4.10 Site access 1 is proposed to be south of a small plantation. The site will contain two wind turbines, the substation and a temporary construction compound.

2.5.4.11 Site access 2 is proposed approximately midway along a field approximately 100m south of a minor road junction leading to Lingen.

2.5.4.12 It is proposed that site access 3 be located approximately 400m south of the junction of the minor road to Lingen. At this point the access road is descending and curving to the left. This leads to a restriction in visibility to the left.

2.5.4.13 About 7,800 m³ of crushed stone in various forms would be required, predominately for construction of the site tracks but also for crane hardstandings, turning areas, and for the storage compound

2.5.4.14 It is currently proposed that the bulk of this stone will be obtained from borrow pits within the site boundary. Whilst the exact location and extent of these pits will depend on where suitable material is present, and on the findings of further surveys and laboratory tests carried out when site investigation works start, two possible borrow pit areas have been identified, as shown on Figure 6b. Borrow Pit Area A includes a former borrow pit (used for constructing farm tracks), which could be extended southwards, whilst Borrow Pit Area B

occupies an area that has already been levelled and had the topsoil removed (to provide an area for storing silage etc).

2.5.4.15 Based on current assessments it is estimated that borrow pits having a total plan area of some 3,000m² would be required (i.e. 50 x 60 m) although ideally several smaller pits would be used, excavated to fit into the contours of the land, which would help to minimise their impacts. The Borrow Pit Areas A & B are both roughly equal to this size, so it is unlikely that both areas will need to be used to the extent shown (if at all).

2.5.4.16 Any further stone would be needed for running surface which would be sourced, locally from existing quarries. Such sourcing of stone and aggregates would ensure that the aggregate is of suitable quality, acidic value and chemical composition so as not to cause environmental or ground contamination in variance with the local soil or geological conditions. This would also provide commercial benefits to the local quarry operators and concrete suppliers.

Temporary Site Infrastructure

2.5.4.17 During the construction phase a storage area would be located adjacent to the access track to Turbine T1. This compound would be approximately 80 m by 50 m in plan and would provide a separate area for 'portacabins' to be used for site offices, storage of various materials and small components, car parking, and welfare and messing facilities. This area would comprise compacted stone similar to the crane hard-standings although the thickness of the stone layer would be reduced to suit the lighter loads appropriate to its use as a storage area. There would also be a collection for sealed waste, and foul drainage would collect in a holding tank for regular collection and disposal off site. Refuse would be stored in bins for regular collection and disposal off site.

Site re-instatement

2.5.4.18 Post-construction reinstatement would include reduction of track widths from 5 m to about 3.0 m by recovering a 1.5 m strip with a minimum of 150 mm of topsoil. Turbine bases would be capped with top soil and re-turfed using original turf. Crane hardstandings would be reduced and profiles blended to adjacent contours. Sufficient soil cover would be laid to

allow natural vegetation to re-establish.

Health and Safety

2.5.4.19 All work would be undertaken to relevant health and safety legislation and other guidelines, and the whole project would be supervised in accordance with the Construction (Design and Management) Regulations 2007 (CDM 2007).

2.5.5 Wind Farm Operation

2.5.5.1 Once the wind farm has been fully commissioned and is operational, each turbine should require minimal attention apart from regular maintenance. The turbines have internal computers which can control their operation and shut them down under certain conditions. The turbines begin to generate electricity when the wind speed at hub-height exceeds around 4 m/s. Wind turbines typically reach their maximum power at wind speeds between 10 m/s and 16 m/s. For safety reasons the turbines would automatically shut down when wind speeds exceed about 25 m/s

Turbine monitoring and control

2.5.5.2 The turbines would be controlled by a sophisticated Supervisory Control and Data Acquisition (SCADA) system, which would gather data from all the turbines and allow control of them from one location.

Highways

2.5.5.3 During the operational lifetime of a wind farm, the main access requirements to the site would be for Operation and Maintenance personnel. Their responsibility is to ensure the smooth and efficient running of the wind turbines, and therefore regular maintenance of the turbines moving parts is required. Typically, this is required twice a year along with occasional visits for minor resets, inspections and repairs. Access to the site is likely to be via four wheel drive or similar O & M vehicle. The number of visits required will not affect overall traffic movements in the vicinity of the site in any way.

2.5.5.4 For more substantial O & M work, such as the unlikely event of nacelle or blade replacement, a crane and support vehicles would be required. For this reason, the site entrance

and site access tracks need to be retained after commissioning of the wind farm. However, only a small amount of vehicles will be required, and there will only be one movement of the vehicles on to site and one movement off-site. This will not add appreciably to vehicular movements in the vicinity of the site.

2.5.6 Land Use

2.5.6.1 The existing land use of the site is for the purposes of agriculture. This will continue around the areas taken up by the proposed development, throughout its operational life.

2.5.6.2 Turbines have been positioned to minimise interference with agricultural activities and given the small percentage of land required by the wind farm, there will be limited impact on agricultural activity throughout the sites operational phase.

2.5.7 Wind Farm Decommissioning

2.5.7.1 Given the current global energy situation it is likely that in twenty five years time the site could be repowered once again with 2nd generation turbines. However if wind energy is no longer needed to help meet our energy needs then the site could be completely decommissioned and returned wholly to agricultural use with minimum disruption to agricultural activities and highways networks. It is estimated that three to six months would be required for complete decommissioning of the site, and removal of on-site infrastructure. Unlike many other large infrastructure projects there would be no significant residual land contamination.

2.6 Landscape and Visual Assessment

2.6.1 This section of the ES presents a full Landscape and Visual Assessment (LVA) commissioned over a 20km radius taking into consideration landscape character, landscape designations and main visual receptors. An assessment of the effects to landscape character and visibility, the latter in regard to the main visual receptors, is undertaken. This includes an assessment of impacts to the historic landscape, listed buildings, historic parks and gardens and

conservation areas. A summary of the assessment is given in the following sub-Sections.

2.6.2 An assessment of the effects on the landscape fabric of the site, which are likely to be brought about through this development was conducted. This assessment concludes that there will be long-term, but reversible effects on the landscape fabric of the site during the operational life of the development of the four wind turbines and the associated infrastructure. The effects of the development on the landscape fabric of the site have been assessed as being likely to be moderate to substantial / substantial.

2.6.3 However, on decommissioning these effects will be reversed and the landscape will be able to be fully restored to normal farming practices. There will be two short sections taken out of drystone walls estimated to be about 7m wide. The total temporary loss of drystone walls estimated at 14m. Therefore there will be some slight and localised effects, but no significant permanent adverse effects on the landscape fabric of the site are anticipated.

2.6.4 With regard to the landscape character of the site, the magnitude of change is judged to be high which, combined with the sensitivity of the landscape to this change being assessed as medium to high; the resulting significance of effect on the landscape character of the site is assessed as being moderate to substantial / substantial. The construction of the development will emphasise the simple, managed medium-to large-scale characteristics of the landscape of this part of the Enclosed Moors and Commons

2.6.5 With regard to the landscape character of the study area, the introduction of four wind turbines with an overall height of 105m to tip will be a long-term, but not permanent change to the landscape. The character within the vicinity of the site, along the Reeves Hill ridge within the Enclosed Moors and Commons landscape type, will change, including the undulating plateau land on which the site lies. The sensitivity of the landscape types in the context of the site is highly variable, in part reflecting the high levels of woodland and forestry present that influence the perception of the landscape, and the number and location of highly sensitive receptors in the landscape.

2.6.6 To the east of the site the threshold of significance would fall at about 2.5km from the proposed turbines, and to the south this would be at about 1.5km. However, in the north the threshold would fall at under 1km, as the land heads into the incised Teme valley and then effects would be significant again for areas between 3.5km to 4.5km farther to the north on rising open land. In the west the threshold would fall at 4km on the highly sensitive open plateau top landscape areas in the Enclosed Moors and Commons / High Enclosed Plateau characterised areas and LANDMAP unit RDNRVS120 Improved Upland eastern Edge Mosaic Upland and Plateau. At greater distances than these, and in the closer well-wooded and valley landscapes the magnitude of effect drops to slight or negligible. This change will be long-term over the 25 year operational life of the project, yet reversible on decommissioning.

2.6.7 Eleven landscape types were defined in the 10km context of the site, in both the Herefordshire and Shropshire landscape character assessments. The approach taken in this assessment was extended into Wales to cover the west of the study area for consistency of approach.

2.6.8 The assessment identified that there would be either no views, or sufficiently low magnitude of effect changes for only very low or negligible effects from the Principal Timbered Farmlands, the Estate Farmlands and the Enclosed Settled Commons landscape types within the study area.

2.6.9 Within the Enclosed Moors and Commons and LANDMAP unit RDNRVS120 Improved Upland Eastern Edge Mosaic Upland and Plateau the assessment concluded that there would be a high magnitude of change of views out to 2km in the east and west, and that in the east the threshold would fall at 3km and at 4km in the west. In the Wooded Hills and Farmlands there would be some moderate to substantial and significant effects to 2.5km from the site. In the High Enclosed Plateau landscape type some significant, moderate to substantial effects would be experienced between 3.5km to 4.5km to the north from this highly sensitive landscape type.

2.6.10 In the Principal Wooded Hills there would be no significant effects, with a high

magnitude of change in view out to 1.5km creating moderate/moderate to substantial effects based on the medium to low sensitivity of the type. In the Principal Settled Farmlands, Riverside Meadows and Wet Pasture Meadows some slight to moderate / moderate non-significant effects would be experienced between 3km to 5km.

2.6.11 With regard to the areas of landscape designations the assessment identified that there would be some significant effects on the Exposed High Enclosed Plateau landscape type, some significant views from the southern edge at Stowe, but none on the users of the Offa's Dyke long distance path or on the Dyke as a feature of cultural heritage value.

2.6.12 Those significant effects identified would be very localised and contained within a small area of the southern edge of the plateau. These effects would not impact on the aims and objectives of the AONB Partnership Management Plan, nor on the integrity, value or used and appreciation of the AONB.

2.6.13 The siting of the development proposal has been sensitively considered in relation to the character of the receiving landscape within which the wind farm is proposed. The sense of place and local distinctiveness of the landscape already strongly relates to exposure, and simple windblown characteristics are present. There would be no loss of characteristic features on the site, other than the temporary loss of 14m of drystone wall. However, the proposed wind turbines would reinforce one of the key characteristics in the local landscape. There would potentially be the loss of four semi-mature ash trees from the access route.

2.6.14 Through the site selection exercise employed for this development, and the design evolution the extent of significant effects on the landscape and visual amenity of the area have been considered. The estimation of these potential effects has influenced the project development. Tools such as wireframes and ZTVs have been used to inform these design decisions. In 1991 the proposal was for 14 wind turbines. However, whilst initially the proposal was for five turbines to be installed at up to 110m to tip, through the design iteration process the number of turbines has been reduced to four, and the tip heights were dropped to 105m to tip.

This had the effect of slightly reducing the visibility of the turbines, as illustrated in the Viewpoints from a range of locations and visual and landscape receptors in the study area, particularly those located in the eastern and western part of the landscape.

2.6.15 Substantial and moderate to substantial effects have been identified from near public rights of way and from dwellings and villages in close proximity to the site. They have also been recorded for traffic on short sections of the near B and proximal unclassified local roads.

2.6.16 Significant effects are concentrated on the local visual receptors, and are broadly contained within 2km to 3km of a proposed wind turbine location in the east and south, and within 4.5km to the north and 4km to the west. These effects on the character and visual amenity of the receptors are not assessed as being significant. The scale of the landscape is medium to large, particularly in the local area of the Enclosed Moors and Commons landscape type, and the simple and sculptural form of the development will potentially add localised interest to a relatively simple part of this landscape without creating clutter or detracting from the simple agrarian patterns.

2.6.17 The assessment of effects on the landscape has demonstrated that there are unlikely to be any significant effects on the landscape fabric of the site, and that the effects assessed as being significant on the character are likely to be brought about on the near landscape of the study area. Nearer to the site the effects are greater, and the assessment has concluded that there will be a localised change in character through the addition of this development within the Enclosed Moors and Commons landscape type. This assessment has taken into account the scale and form of both the landscape and the proposed wind turbines. This is an exposed and open landscape and these characteristics relate well and directly to the form and purpose of wind turbines.

2.6.18 A detailed landscape character assessment has been undertaken by CCW as LANDMAP in Wales and by Herefordshire and Shropshire Councils, including all of the study area, and by the author of the LVA of the site, which formed the baseline against which the magnitudes of change, sensitivity of receiving

landscape and visual receptors have been assessed. The English approach to assessing the landscape was also carried over into the Welsh part of the study area for consistency of assessment. It has assisted in the judgement that the changes likely to occur will bring about a change in the local landscape character. This change will be broadly perceived to have an effect on the landscape of the undulating ridge within the Enclosed Moors and Commons on which the site sits.

2.6.19 It has been concluded that the development relates well to the receiving landscape character of the site and the perception of the landscape. A development of this nature in this location will not adversely detract from the sub-regional landscape character or the diversity of landscape character beyond the local context.

2.6.20 The scale and design of the development has been carefully considered through the development of the proposals. The scale, design and layout of the scheme and materials are appropriate to the landscape character and development proposed.

2.6.21 In conclusion, those significant effects that have been identified in this landscape and visual impact assessment are judged to be localised.

2.7 Landscape and Visual Assessment Cumulative Effects

2.7.1 A full cumulative landscape and visual impact assessment is not required under the terms of the EIA regulations as there are no other recently proposed, consented or operational wind farms within the zone of theoretical visibility (ZTV), and only one proposed wind farm within a 30km radius of the site. The location of the proposed Pentre Trump WindCluster is 16km to the south-west of the site.

2.8 Ecological Assessment

2.8.1 Whilst Reeves Hill falls within an Enclosed Moors and Commons landscape type there is little natural cover or habitat remaining from such enclosure. The agricultural land

management for arable and livestock is managed as intensively as most other lowland areas with a significantly greater loss of stone wall and hedgerow boundary features which may have previously characterised the area.

2.8.2 Bird populations are diverse throughout the year but the low counts for all species indicate that the resource base is low in terms of food sources and breeding opportunities. However, the construction and operation of the windfarm should not adversely affect this situation. Construction should be started and completed at an appropriate time of year to avoid ground nesting birds (and hibernating amphibians) minimising direct impacts on their populations. The wind energy scheme will have very small areas of land-take of the improved areas of land with little scrub or tree removal removals. Therefore little loss of breeding or foraging habitat will take place.

2.8.3 However, where habitat and ecological opportunities exist at Reeves Hill they are small in area, scattered in distribution and compromised by planting of many exotic tree/shrub species. There are opportunities for enhancement of habitat elsewhere within the area away from the turbines to cater for any ecological displacement of species which may happen due to loss of breeding for ground nesting birds such as skylark. This would also have the benefit of drawing skylark away from the immediate vicinity of the turbines where presenting their aerial song may a cause of mortality. Impacts on the breeding bird population should be minimal.

2.8.4 The bodies of standing water clearly provide a good resource harbouring what would appear to be small numbers of amphibians including great crested newt.

2.8.5 However, the latter species was widely distributed across the whole area of survey in spite of the intensive farming. Hibernaculae and breeding sites would appear to be adequate.

2.8.6 The development will only affect amphibian populations through loss of hibernaculae and lowering of water tables for which there should be adequate mitigation written into the method statements for construction and the Defra development licence. Enhancements in the creation of hibernaculae

and improvements in pond management will significantly improve this landscape for the populations of all amphibians present

2.8.7 The collision factors for larger raptors are always a concern for wind farms but it is important to distinguish between the impact upon animal welfare and the impact upon the population of species. Collisions are less likely to be a problem for merlin as they are low, fast fliers and adept at turning quickly. However, for Schedule 1 birds of prey such as Red Kite who seek much of their food by soaring and scavenging this presents an issue in the site's development. Buzzards likewise may be affected but the population of this species is far more resilient to loss. Red Kites too are on the increase but are not widespread. Protection of their populations is crucial to maintain the increases seen in recent years. The avoidance of turbine blades has been shown to be of the order of 98-99% for red kite (Whitfield and Madders 2006). Based upon the findings of vantage point studies at Reeves Hill, the amount of time spent by these birds on the site is very small and this coupled, with the turbine separation distances, should result in a minimal risk to these birds. The risk of lowering local populations of red kite through collision fatalities would appear to be low.

2.8.8 Collisions of other birds with the turbine blades will also be of a low order of risk. Collision calculations require considerable data for validation of risks. Given the low counts over considerable a time period, the low numbers of potential collisions at Reeves Hill make quantifying collision risk accurately could be problematic and is therefore not presented here.

2.8.9 The presence of a reasonable diversity of bats along the proposed line of turbines is surprising given the type of landscape and its elevation. Small numbers of species are present and the greatest risk is the collision impact with the blades by Noctule and Leisler's bats which fly at some altitude above the ground. They will be traversing the site from roost sites to foraging areas therefore bring them into conflict with the windfarm.

2.8.10 Little research in the UK has been done on the subject and as yet the risk is unquantified and mitigation methods unexplored. However,

there will be some potential for collisions even without influencing factors such as frequency disruption or lack of ability for avoidance in flight. The risk to these two species of bat in particular must be seen as significant given their protected status and adopting the precautionary principle.

2.8.11 Risk from construction and operation of the wind energy scheme to other species such as otter, badger, polecat, hare and water vole are negligible. The animals are not resident within the study area (water vole droppings are awaiting verification) but utilise the site for foraging and travelling between their preferred habitats. The construction effort may temporarily disturb these animals and so adequate mitigation will be put in place via the method statements for construction.

2.8.12 The proposed positions of the turbines and location of other installations do not have any serious implications for direct loss of habitat. Siting may impinge upon potential skylark nesting habitat and possible hibernaculae for great crested newt. Adequate mitigation can be achieved avoid impacts on these species through appropriate checks and seasonal programming of works.

2.8.13 Should the construction of the wind energy scheme be approved, a monitoring strategy for the effect of the wind energy scheme on fauna, especially bats and birds should be undertaken. This is of specific importance to bats for which there is very little data and knowledge of the conflicts involved. Impacts on bird populations also require monitoring to assess the ongoing significance of the impact of wind farms on breeding and foraging populations.

2.8.14 Cumulative effects should also be a consideration. These can stem from two sources: the progressive impact of construction stages especially should there be delays in construction, and the cumulative impact from other developments. The former can be examined and included within the ecological method statements for construction but the latter will require an assessment of other developments in the area just prior.

2.9 Noise Assessment

2.9.1 An assessment of the potential noise impact associated with the proposed wind energy development at Reeves Hill has been performed. The guidance contained within ETSU-R-97 has been used to assess the potential noise impact of the proposed development.

2.9.2 There are no other existing or proposed wind farm developments within sensitive proximity to the proposed Reeves Hill Community Wind Energy Scheme development. Cumulative noise impact assessment is therefore not necessary.

2.9.3 Background noise measurements were made at five locations neighbouring the proposed wind farm based upon preliminary predictions.

2.9.4 Analysis of the measured data has been performed in accordance with ETSU-R-97 to determine the pre-existing background noise environment at these locations.

2.9.5 Predictions of wind turbine noise have been made, based upon a guaranteed sound power level for an Enercon E70 2.3 MW machine and a calculation procedure which is considered to be worst-case.

2.9.6 Predicted levels and measured background noise levels indicate that, for the majority of circumstances, at all receptor locations neighbouring the proposed site, wind turbine noise will meet the Lower Amenity Hours and Night-time Noise Criteria proposed within ETSU-R-97.

2.10 Hydrological Assessment

2.10.1 The assessment identified the existing water features within the site boundary through a desk study and site walkover. Water features within a 500 m buffer zone around proposed turbine and track locations have been identified.

2.10.2 The results of the desk study and site walkover provided baseline environmental information with respect to the local water environment. These results have allowed the identification of potential impacts during the construction, operation and decommissioning

phases with respect to hydrological conditions. Following the assessment, recommendations for mitigation to negate or minimise these impacts have also been provided.

2.10.3 Track construction will result in minor changes to the hydrological regime by the introduction of less permeable surfaces but the adverse impact is considered to be of negligible significance.

2.10.4 During construction, chemical storage and maintenance/ refuelling would be undertaken in a responsible manner. Appropriate training and pollution prevention guidelines should be adhered to, including response measures to deal with potential spills or leaks.

2.10.5 There is potential for increased sediment entering watercourses through erosion of the track and compound surfaces during periods of prolonged heavy rainfall. However, runoff will be diverted into vegetated ditches and either infiltrate or be discharged to spillways. Furthermore, the works are located away from watercourses.

2.10.6 Alkaline leaching from the buried turbine bases will be eliminated by use of sulphate resistant concrete where required.

2.10.7 Once the wind farm is operational the effects on hydrology and hydrogeology would be less than during the construction stage.

2.11 Archaeological Assessment

2.11.1 The initial desk-based study of the area involved the examination of readily available written, cartographic, and aerial photographic sources in the following repositories: the Regional Historic Environment Record (HER) held by Herefordshire County Council in Hereford, and also the HER held by the Clwyd-Powys Archaeological Trust in Welshpool; the County Archives Service for Herefordshire, also based in Hereford; the National Library of Wales in Aberystwyth; and the National Monument Record (NMR), a department of the Royal Commission on the Ancient and Historical Monuments of Wales in Aberystwyth. Aerial photographs were provided by the NMR in Aberystwyth, and through them from the

Central Register of Aerial Photography in Wales, a section of the Welsh Assembly Government based in Cardiff. Data on scheduled ancient monuments and listed buildings derived from lists prepared by English Heritage and by Cadw was also examined.

2.11.2 Following the completion of the desk-based element of the assessment, a field visit to was undertaken to the proposal area. This reviewed the evidence for sites which had been revealed at the desk-based stage, and also examined the area of the proposed development for previously unrecorded archaeological sites. The method adopted was based on transect walking techniques with a separation between transects of the order of 50m, although this was adjusted in accordance with safe operating methods, where necessary. Sites found during the field visit were located in relation to the national grid using hand-held global positioning system (GPS) equipment

2.11.3 This assessment has integrated both desk-top and field survey, together with the results of previous archaeological work, to determine the archaeological resource of the development area, and the information has been set within a broader framework of the utilization of Reeves and Stonewall Hills in previous centuries.

2.11.4 Within the boundary of the development area 63 sites, features and complexes of archaeological interest have been recorded, none of which are nationally designated sites. The importance of all the sites and the potential effects of the proposed development have been assessed. Potential physical impacts have been identified for 17 of these sites or features, though many of these should be avoided by careful micro-siting. There is also a more general impact on the historic boundaries within the area.

2.11.5 Appropriate mitigation measures are considered, with an underlying principle that no identified archaeological site, regardless of its category should be significantly disturbed unless this proves to be wholly unavoidable. Those mitigation measures should ensure that there are no major or moderate changes to the visible archaeological resource. In addition to the specific mitigation measures related to individual archaeological sites, general

recommendations have been made to minimise the potential impact of the construction and operation of the wind farm on the archaeological resource of the proposal area, including the maintenance of a watching brief during construction works and the clear marking out of areas of archaeological sensitivity.

2.12 Electromagnetic Interference and Air Safeguarding

2.12.1 A wide range of operators of microwave and other communication links has been consulted in the early phases of the environmental impact assessment for the Reeves Hill Community Wind Energy Scheme. A small number of microwave operators identified potential interference issues but it was later ascertained that no conflicts would arise. There are no outstanding objections.

2.12.2 The MOD and CAA have been consulted and they have not raised any objections with respect to the proposed Reeves Hill Community Wind Energy Scheme. NATS has airsafeguarding interests linked to the Clew Hill radar installation, but it has been identified that the MOD has no concerns in relation to the installation, which they manage jointly with NATS.

2.13 Public Access and Safety

2.13.1 All the factors that could compromise private and public use, safety and amenity have been assessed in respect of the Reeves Hill Community Wind Energy Scheme proposal. These factors include private use of the land, public access and amenity, public safety, driver distraction and shadow flicker.

2.13.2 It has been established that public access, private residences, recreation and public safety would not be significantly affected by the Reeves Hill Community Wind Energy Scheme proposal.

2.13.3 It should be noted that there is no evidence of any danger to public users of rights of way in the vicinity of operational wind farms across Europe and modern wind turbines display performances that do not engender any threats to public safety.

2.13.4 With respect to bridleway WE15, guidance is available in the form of PPS22 above, and that issued by the Countryside Agency (now Natural England) and the British Horse Society. PPS22 guidance is presented above.

2.13.5 The Countryside Agency guidance (AP 99/50) recommends a minimum separation distance of three times the height of the turbine from a bridleway. The guidance does not cite any evidence of effects to horse users by wind turbines and in effect constitutes the precautionary approach to safety.

2.13.6 The British Horse Society issued its own guidance in 2004, recommending a minimum separation distance of 200m between bridleways and wind turbines. Again no evidence of safety issues was cited in this guidance. It is understood that the BHS now supports the guidance issued by the Countryside Agency, cited above.

2.13.7 With respect to the Reeves Hill scheme, Turbine 1 would be located a minimum of 110m from the bridleway, WE15. This distance accords with the advice in PPS22 but does not accord with the guidance from the Countryside Agency. There are a number of reasons why the Developer has opted to accommodate this separation from the bridleway:

- In the absence of evidence that wind turbines conflict with bridleway interests it is felt that there is no solid basis for the Countryside Agency guidance. Such guidance was developed in isolation without the advice of local authorities and wind energy developers, and as such is not representative of the interests of the principal stakeholders involved in such developments.
- Adopting the Countryside Agency guidance would effectively sterilise large areas of potential for wind energy development. Consequently, guidance developed in a vacuum where there is no evidence of impacts to the safety of horse users would effectively disable developments that would have a demonstrable benefit to UK and global climate change goals as well as setting a

precedent for establishing 'guidance' without due consultation process.

- Bridleway WE15 is very rarely used by horse users and there are protracted periods of redundancy in the route.
- The Developer is proposing a Permissive Bridleway through the wind farm site, which itself would be at no point less than fall over distance plus 10m from the nearest wind turbine. This has followed consultation with local horse riders who would welcome a new bridleway across Reeves Hill shown in Figure 32 (Volume3).
- Bridleway WE15 covers a short stretch of approximately 600 metres and connects with roadways at either end. There is no continuation to the bridleway – users are expected to use the public road. The recommended separation distance from highways (PPS22) is fallover distance plus 10m. It would be nonsensical accommodate a greater separation distance from the bridleway when turbines would only be fallover plus 10m from the public highway.
- Lastly, the open ground at either end of the wind energy scheme at which points horse users would access the bridleway allows for clear views of the turbines prior to entering the wind farm site. Consequently, the wind turbines would not surprise the horses, and they would be able to become familiar with them prior to passing close to them. This should alleviate safety concerns to horse users.

2.13.8 With regard to the safety of wind turbines, they, like most other engineering products such as cars or aircraft – they are designed to operate to high standards of safety. All site work for the Reeves Hill Community Wind Energy scheme would have to comply with the Construction (Design and Management) Regulations 2007 approved code of practice. Properly designed, constructed and maintained wind turbines are known to be entirely safe and would not constitute a danger to the public or maintenance personnel. In addition, the wind turbines would be fully certified by an

internationally recognised authority, for example Germanischer Lloyd, as being suitable for the site conditions, and they would have a proven track record. Warranties would be sought from the wind turbine manufacturer such that the selected model will be suitable for the site ground and wind conditions. A computer control system would monitor the wind turbines at all times to make sure they are operating safely and operators would be able to communicate with the control system remotely. If a fault were to develop, the particular wind turbine would automatically shut down and send an alarm to the maintenance engineer. In the event of a more serious fault the entire wind farm would be disconnected from the grid and completely shut down.

2.13.9 In very high winds (greater than 25 metres per second) the wind turbines would stop automatically. There would also be a lightning protection and earthing system. Sensors would prevent the wind turbines from working should unusual events occur such as the build up of ice on the blades, as an imbalance in the rotor is detected. This prevents ice from being thrown from a rotating wind turbine. With respect to the Reeves Hill scheme, Turbine 1 would be located a minimum of 110m from the bridleway, WE15. This distance accords with the advice in PPS22 but does not accord with the guidance from the Countryside Agency. There are a number of reasons why the Developer has opted to accommodate this separation from the bridleway.

2.13.10 With regard to driver distraction, motorists today face many distractions and issues have been raised in the past with respect to the potential for wind turbines to affect the attention of vehicle users. However, research carried out for the purposes of this assessment into driver distraction with respect to existing wind farms gave no reason to believe that the wind turbines would be an added distraction to motorists on local roads.

2.13.11 The proposed turbines at Reeves Hill would be a considerable distance from A or B class roads (>3kms) but would be located alongside two C class roads to the north and west of Reeves Hill. Such roads have very limited use, restricted largely to local inhabitants and a very few visitors.

2.13.12 With regard to shadow flicker, the wind turbines proposed for the Reeves Hill site will have a rotor diameter of up to 71m. Therefore the shadow flicker assessment has been carried out for properties that lie within 710m (10 x rotor diameter) of the wind turbines within 130 degrees either side of north, relative to the wind turbines. There are five properties falling within 710m of the wind turbines and are orientated in a compass direction that could witness shadow flicker effects.

- No shadow flicker is predicted at Maryvale.
- There is potential for shadow flicker to occur at Folly Farm in the period 18th November to 23rd January. The total time of shadow flicker per year would be 30 hours, with a maximum period in one day of 32 minutes.
- There is potential for shadow flicker to occur at the Nutters in the period 8th November to 2nd February. The total time of shadow flicker per year would be 30 hours, with a maximum period in one day of 30 minutes.
- There is potential for shadow flicker to occur at Tipton Farm in the period 6th May to 6th August. The total time of shadow flicker per year would be 28 hours, with a maximum period in one day of 30 minutes.
- There is potential for shadow flicker to occur at Willey House in the periods 24th March to 10th April and 1st to 18th September. The total time of shadow flicker per year would be 12 hours, with a maximum period in one day of 28 minutes.

2.14 Socio-Economic Impacts and Environmental Benefits

2.14.1 The Reeves Hill Community Wind Energy Scheme proposal would provide substantial benefits, both financially and environmentally. Suitably qualified local contractors will have the opportunity to bid for the civil and electrical works and the provision of site services; a potential investment of up to £2,000,000. The proposal would provide a

reliable income stream for the landowners, an educational resource for local schools and colleges, and following construction the Developer would register local community interest in a community trust fund based on the financial output of the scheme. Such a scheme would aim to facilitate the distribution of funds for local initiatives, which may reasonably be linked to the tied issues of energy education and energy efficiency for the local Parishes. The energy efficiency measures could potentially be significantly increased with match funding from other national energy efficiency schemes.

2.14.2 Support for a renewable energy educational facility has been proposed in principal to supplement the current educational function the spaceguard centre forms for school children.

2.14.3 Following planning consent, if awarded, the Developer will implement a direct community benefits' package financed from the project cash flows. Each year for the next 25 years, the local community would benefit to the tune of £10,000, for each turbine (of over 2mw capacity). A co-operative organisation the experienced wind farm community facilitator Energy4all would also contribute £10,000 annually to a local community and parish trust funds for this project. This would amount to a total contribution to local communities equal to £1 million over the 25 year lifetime of the development. One turbine will be owned by a co-operative company set up Energy4all. The resulting co-operative company will provide an opportunity for local investment up to a maximum shareholding of £20,000 for any one individual and will also contribute £10,000 annually to a local community trust. This will make a total of £40,000 per annum, a sum that will be reviewed after a period of five years to reflect interim development in energy prices.

2.14.4 No conclusive evidence is yet emerging of the effects to property prices arising from wind farms, even in the light of the research undertaken by The Royal Institution of Chartered Surveyors and the British Wind Energy Association, but anecdotal evidence to date demonstrates that there is no clear evidence of a correlation and that actual studies of residents at existing wind farms show that property prices are not affected by such developments. More research is required to

determine whether effects to property prices can be correlated to wind farms. However, it should be noted that this, technically, is not a land use planning issue and should not rightfully enter the balance of opinion in determining the planning application.

2.14.5 The development of more renewable energy would contribute towards measures to reduce the effects of acid rain and environmental pollution, whilst comprising a source of locally embedded electricity supply, which would be beneficial in terms of the possible disruption to fuel supplies from overseas.

2.14.6 The Developer will enter into a long term Power Purchase Agreement with an electricity supplier. This agreement will allow the financing of the wind farm to take place and thus the construction and operation.

2.14.7 Wind farms are generally seen as neutral or slightly positive in terms of effects on tourist numbers. To date, there is no evidence through numerous public opinion surveys to indicate that wind farms are detrimental to tourism.

2.14.8 Wind turbines are recognised as having a positive energy balance. Over their lifetime they can repay at least 50 times the energy used in their manufacture and installation. Wind turbines also provide benefits through their 'embedded value' as a local generator.

2.14.9 Reeves Hill Community Wind Energy Scheme proposal comprises four (4) wind turbines and will produce sufficient electricity to provide for the equivalent needs of over 5,144 households. This is equivalent to approximately 6.9% of the total County's domestic needs. The Reeves Hill Community Wind Energy Scheme would make a significant contribution to the reduction of emissions that are known to cause global warming and acid rain. Based conservatively on a 2.3MW wind turbine, these would amount to the following savings:

Emissions type	Lower end of range – 370kg.MW/hr	Higher end of range – 860kg/MW/hr
CO ₂	8,945 tonnes p.a.	21,179 tonnes p.a.

SO ₂	241 tonnes p.a.	241 tonnes p.a
NO _x	72 tonnes p.a.	72 tonnes p.a

- The scale and design of the development has been carefully considered through the development of the proposals. The scale, design and layout of the scheme and materials are appropriate to the landscape character and development proposed.
- Those significant effects that have been identified in this landscape and visual impact assessment are judged to be localised.

2.15 Avoidance and Mitigation of Residual Environmental Impacts

2.15.1 Introduction

2.15.1.1 Site selection and the evolution of the site has largely enabled the avoidance of significant impacts as defined by the EIA Regulations. Some significant impacts remain, solely in respect of landscape and visual issues, and these are a matter for the Council to evaluate and consider in coming to a balance of opinion.

2.15.1.2 Where residual impacts from the development have been identified, the following mitigation measures are recommended:

2.15.2 Landscape and Visual Issues

2.15.2.1 Impacts to the landscape and visual receptors within the study area of the wind farm will arise, and in some cases these have been shown to be significant. The developer has endeavoured to limit the potential for impacts by:

- Limiting the height of the turbines to respect the scale of the landscape to 105m.
- Restricting the number of turbines on site to 4.
- Limiting the landtake, re-instating the non essential infrastructure, returning the track width to 3.5m.
- It has been concluded that the development relates well to the receiving landscape character of the site and the perception of the landscape. A development of this nature in this location will not adversely detract from the sub-regional landscape character or the diversity of landscape character beyond the local context.

2.15.3 Noise Issues

2.15.3.1 Predictions of wind turbine noise have been made, based upon a warranted sound power level and a calculation procedure which is considered to be worst-case. Predicted levels and measured background noise levels indicate that, for the majority of circumstances, at all receptor locations neighbouring the proposed site, wind turbine noise will meet the Lower Amenity Hours and Night-time Noise Criteria proposed within ETSU-R-97. Consequently, no mitigation measures are proposed for this scheme.

2.15.4 Ecological Issues

2.15.4.1 An ecological assessment of Reeves Hill Community Wind Energy Scheme site was conducted both on site and in the immediate surroundings in order to identify any areas of ecological interest that may be affected by the potential development.

2.15.4.2 Under the EIA Regulations, mitigation is required where significant likely environmental effects are identified. Mitigation to avoid adverse impacts is then identified.

2.15.4.3 The ecological assessment has identified mitigation measures required during construction to avoid nesting farmland birds, Construction works should be timed to avoid disturbance to important species. Although no disturbance to current locations of badger activity are anticipated, any works necessary will be proposed under Natural England/ EPS licences.

2.15.4.4 The Phase I habitat identified few habitats of value. However, where habitat and ecological opportunities exist at Reeves Hill they are small in area, scattered in distribution

and compromised by planting of many exotic tree/shrub species.

2.15.4.5 The breeding bird and winter bird surveys did not record species in sufficient frequency to identify significant effects expected from the proposal.

2.15.4.6 The raptor species recorded using the site area at Reeves Hill, spent a small amount of time on site, and this coupled, with the turbine separation distances, should result in a minimal risk to these birds. No mitigation measures are recommended.

2.15.4.7 With regard to bats, little research in the UK has been done on the subject of interactions with wind turbines. As yet the risk is unquantified and mitigation methods unexplored. However, there will be some potential for collisions even without influencing factors such as frequency disruption or lack of ability for avoidance in flight. The risk to two species of bat in particular must be seen as significant given their protected status and when adopting the precautionary principle.

2.15.4.8 Given the design of the wind farm, and the implementation of mitigation measures, the construction and operation of the proposed development is likely to result in ecological impacts of a low significance only, and within the life of the proposal, any habitat enhancement measures could bring significant ecological benefits. The negative impacts are not significant for the purposes of the EIA Regulations. Under the EIA Regulations, mitigation is required where significant likely environmental effects are identified. Mitigation is not required to be considered for impacts of less than EIA significance. This assessment has found that most of the predicted effects on valued ecological receptors are not significant. However, a number of measures have been identified which can further reduce the potential impact of the proposal on ecological receptors. Also, mitigation is required where effects on legally protected species have been identified.

Habitat Enhancement Plan

2.15.4.9 In order to mitigate for many of the potential anticipated impacts and to provide positive ecological benefits to be associated with

the proposal, the developer will be open to engage in the development of potential habitat improvement and restoration measures.

2.15.4.10 Any Habitat Management measures will be prepared subsequently consulted on with the principal consultees, Natural England, The Herefordshire Wildlife Trust, RSPB and the Herefordshire Bat Group.

2.15.4.11 Suggestions for inclusion within the habitat enhancement are:

- potential enhancement of scrub habitat
- hedgerow planting
- management of grass cutting

2.15.5 Hydrological Issues

2.15.5.1 Track construction will result in minor changes to the hydrological regime by the introduction of less permeable surfaces but the adverse impact is considered to be of negligible significance.

2.15.5.2 During construction, chemical storage and maintenance / refuelling would be undertaken in a responsible manner. Appropriate training and pollution prevention guidelines should be adhered to, including response measures to deal with potential spills or leaks.

2.15.5.3 There is potential for increased sediment entering watercourses through erosion of the track and compound surfaces during periods of prolonged heavy rainfall. However, runoff will be diverted into vegetated ditches and either infiltrate or be discharged to spillways. Furthermore, the works are located away from watercourses.

2.15.6 Archaeological Issues

2.15.6.1 Several mitigation measures have been incorporated into the design process which have already reduced the potential negative impacts of the proposed development, including:

- micro siting of access tracks to avoid conflict with archaeological features.
- layout of tracks to follow contours and avoid sensitive resources;

- minimising hedgerow severance and replacing lost hedgerow; and
- closely aligning cable routes to access roads in order to minimise construction impacts.

2.15.6.2 A watching brief for the recording and monitoring of archaeological remains will be carried out during intrusive construction works within the site. If archaeological features are encountered, they will be sampled and recorded, which will partially mitigate their loss by preserving them by record.

2.15.6.3 Potential physical impacts have been identified for 17 of these sites or features, though many of these should be avoided by careful micro-siting.

2.15.6.4 The mitigation methods associated with broach of the dry stone wall are to stabilise the wall at the points of break.

2.15.6.5 The developer is open to discussion to agree potential restorative action regarding the existing condition of the dry stone wall.

2.15.7 Electromagnetic Interference Issues

2.15.7.1 A wide range of operators of microwave and other communication links has been consulted in the early phases of the environmental impact assessment for the Reeves Hill Community Wind Energy Scheme. A small number of microwave operators identified potential interference issues but it was later ascertained that no conflicts would arise. There are no outstanding objections.

2.15.7.2 The MOD and CAA have been consulted and they have not raised any objections with respect to the proposed Reeves Hill Community Wind Energy Scheme.

2.15.7.3 NATS has airsafeguarding interests linked to the Clee Hill radar installation, but it has been identified that the MOD has no concerns in relation to the installation and the report conducted by Pager Power believes that there is a low risk of NATS/NERL objecting to a wind farm at this location.

2.16 Conclusions

2.16.1 The Reeves Hill Community Wind Energy Scheme has been carefully designed through a number of iterations in accordance with all the statutory requirements and established best practice design principles. The proposal is for four wind turbines and ancillary equipment and on-site infrastructure for a period of twenty-five years on land located south east of Knighton on the Powys/Herefordshire border.

2.16.2 Each new wind turbine would potentially have a generating capacity of up to 2.3 Megawatts (MW), and would be a three-bladed design with a maximum tip height of up to 105m.

2.16.3 Within the available site area the Developer has sought to optimise the generation capacity of the site to ensure the maximum generating output, and hence optimise the contribution the site would make to national and local policy goals in respect of climate change, environmental pollution and security of energy supply. In doing so, the Developer has also sought to achieve a design that respects the local environment and limits the negative impacts of the scheme.

2.16.4 Based upon the established wind regime for the site electricity production will be approximately 24,177 Megawatt-hours (MWhrs) per annum. This is equivalent to the annual average electrical energy needs of approximately 5,144 homes based on an average energy consumption per household of 4700 Kilowatt Hours (kWhrs) per year. This would therefore provide clean, economic renewable energy equivalent to the domestic consumption of approximately 6.9% of homes in the North Herefordshire District Council area based on 2001 census figures of 74,282 houses.

2.16.5 During construction, contracts equal to approximately £2 million pounds would be available by competitive tender to regional construction companies.

2.16.6 Through the lifetime of the project the Developer will remain open to the approach for financial support for local community projects.

2.16.7 The lifetime of the project will represent an ongoing investment into the local economy

through rents, rates and employment for local servicing and site maintenance staff.

2.16.8 The proposal will contribute significantly to the reduction of greenhouse gas emissions to the atmosphere, which are scientifically accepted to be a major contributor to human induced climate change now identified as the biggest threat to our planet.

2.16.9 The proposal will also make a significant contribution to the local electrical energy needs reducing our reliance on imported fossil fuels and hence increasing the security of our supply.

2.16.10 This will constitute a commitment by Herefordshire Council to the attainment of national and regional renewable energy targets for the United Kingdom. Such benefits are now, as established by Planning Policy Statement 22: Renewable Energy (2004), the subsequent Energy Review (2006) and the resulting Energy White Paper (2007). These national policy documents are material considerations in any planning application for renewable energy projects and should be considered by the local planning authority when determining such an application.

2.16.11 Throughout the environmental assessment process, advice from consultants and consultees has been taken into consideration to ensure that the potential effects of the Reeves Hill Community Wind Energy Scheme proposal on the local ecology and environment are avoided altogether or reduced to a level that would not cause significant impact or damage. Such measures have been incorporated into the final wind farm layout and design as information became available during the course of the assessment.

2.16.12 The landscape and visual impacts of the proposed turbines are judged to be appropriate to the landscape character and development proposed. Those significant effects that have been identified in this landscape and visual impact assessment are judged to be localised.

2.16.13 The noise emissions of the site would meet the threshold requirements of the agreed national standard ETSU R-97.