



Environmental Statement: Non Technical Summary

Proposal for 500 kW Wind Turbine
at Wreys Barton Farm, Lewdown, Devon

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Figure 1.1: Site Location Plan

1 INTRODUCTION

Background

- 1.1. RMA Environmental Limited was commissioned by Murex Energy (the Applicant) to produce an Environmental Statement (ES) to accompany a planning application for a single 500 kW wind turbine on land Wreys Barton Farm, Lewdown, Okehampton, Devon. The location of the application site is shown in Figure 1.1 and the wind turbine itself is centered on National Grid Reference (NGR) SX 43810 87623.
- 1.2. The Applicant requested a Screening Opinion from West Devon Borough Council on the 8th August 2014 under the *Town and Country Planning (Environmental Impact Assessment) Regulations 2011 [Statutory Instruments 2011 No. 1824]* (EIA Regulations). West Devon Borough Council adopted a formal Screening Opinion on 8th September 2014, which concluded that the proposed wind turbine at Wreys Barton Farm should be the subject of an Environmental Impact Assessment (EIA) under the EIA Regulations and that the planning application should therefore be accompanied by an ES, to set out the findings of the EIA.
- 1.3. As a requirement of the EIA Regulations, this Non Technical Summary (NTS) provides a summary of the ES in non-technical language; it aims to provide a fair reflection of the ES and includes all aspects of the EIA process, as well as the likely significant environmental effects of the proposed development.

Rationale - The Need for Renewable Energy in Devon

- 1.4. There is an international will to tackle the major issues which threaten the wellbeing of the current and future global community – especially the challenges faced as a result of climate change and a need to reduce emissions of greenhouse gases, such as carbon dioxide - the main cause of global warming.
- 1.5. As reported in RegenSW's Renewable Energy Progress Report 2013, the South West has over 1 GW of renewable energy capacity which supplies 7.3% of the South West's electricity. However, the South West is not on track to meet the Government's target of 15% of South West energy from renewable sources by 2020. On the current trend, the South West will reach around 9%.
- 1.6. In this context, it is proposed to construct a wind turbine at Wreys Barton Farm that would provide a significant contribution (i.e. an additional 500 kilowatts (kW) or 0.5 MW) towards meeting the South West's target and the nation's overall target for generating renewable electricity.

Structure of this Report and Project Team

- 1.7. In light of the comments contained within West Devon Borough Council's Screening Opinion and experience on the scope of similar schemes in Devon and Cornwall, the main ES contains the following chapters:

Table 1.1: ES Contents and Project Team

CHAPTER/ENVIRONMENTAL TOPIC	CONSULTANT
<p>Chapter 1.0 – Introduction, including:</p> <ul style="list-style-type: none"> - A description of the proposed development; - EIA Screening; and - Structure of the ES and Project Team. 	RMA Environmental Ltd
<p>Chapter 2.0 – Assessment Methodology, including:</p> <ul style="list-style-type: none"> - The need for an ES (Screening); - Content of the ES (Scoping); and - Consultation process. 	RMA Environmental Ltd
<p>Chapter 3.0 - Planning Policy: Relevant legislation and planning policy which encourages the development of renewable energy schemes as part of a commitment to limit carbon emissions and the adverse effects of climate change/global warming; including:</p> <ul style="list-style-type: none"> - International Context; - National Context; and - Development Plan Context (West Devon Borough Council Local Plan). 	RMA Environmental Ltd
<p>Chapter 4.0 – Baseline Environmental Conditions, including an overview of the existing environmental conditions at site and its surroundings.</p>	RMA Environmental Ltd
<p>Chapter 5.0 - Construction and Environmental Management, including:</p> <ul style="list-style-type: none"> - Outline of Turbine Construction; - Construction Traffic Management; - Decommissioning; and - Environmental Management Measures. 	RMA Environmental Ltd
<p>Chapter 6.0 - Shadow Flicker, including:</p> <ul style="list-style-type: none"> - Policy Context; - Assessment Methodology; - Baseline Environmental Conditions; and - Assessment of Effects. 	RMA Environmental Ltd

CHAPTER/ENVIRONMENTAL TOPIC	CONSULTANT
Chapter 7.0 - Electromagnetic Interference and Aviation , including: <ul style="list-style-type: none"> - Policy Context; - Effects on Microwave Links (Telecommunications; Water, Electricity and Utilities Industries); and - Effects on Aviation (Civil Aviation Authority, Ministry of Defence and National Air Traffic Service). 	RMA Environmental Ltd
Chapter 8.0 - Landscape and Visual Impact , including: <ul style="list-style-type: none"> - Policy Context; - Assessment Methodology; - Baseline Environmental Conditions; and - Assessment of Effects. 	The Environmental Dimension Partnership (EDP)
Chapter 9.0 - Noise , including: <ul style="list-style-type: none"> - Policy Context; - Assessment Methodology; - Baseline Environmental Conditions; and - Assessment of Effects. 	Ion Acoustics Ltd
Chapter 10.0 – Ecology and Nature Conservation , including: <ul style="list-style-type: none"> - Policy Context; - Assessment Methodology; - Baseline Environmental Conditions; and - Assessment of Effects. 	Seasons Ecology
Chapter 11.0 - Archaeology & Cultural Heritage , including: <ul style="list-style-type: none"> - Policy Context; - Assessment Methodology; - Baseline Environmental Conditions; and - Assessment of Effects. 	Southwest Archaeology
Chapter 12.0 – Summary and Conclusions	RMA Environmental Ltd

2 EIA METHODOLOGY

Objectives

- 2.1. The principal objective of the EIA process is to provide the Local Planning Authority (in this case, West Devon Borough Council), statutory consultees and other interested parties with a clear and concise technical document that provides sufficient information on the proposed development and its likely environmental effects to assist in making a decision on whether planning permission should be granted.
- 2.2. There are three basic steps used in the EIA process in order to meet this objective, which are as follows:
 - establish existing baseline environmental conditions including any current environmental problems. This task is divided into two phases:
 - collection and review of existing data relating to the application site, including consultation with statutory and non-statutory bodies; and
 - the enhancement of existing data, where necessary, with information collected through further site investigation or survey.
 - identify, predict and assess the significance of the likely environmental effects (both beneficial and adverse), which could be expected as a result of the development proposals, covering those environmental issues that were considered to be potentially significant during scoping discussions with statutory consultees; and
 - design mitigation and management measures, which would be adopted to prevent, reduce or remedy any significant adverse effects. Consideration is also given to enhancement measures that would be implemented to promote positive environmental benefits as a part of these proposals.

Legislative Background

- 2.3. This EIA has been carried out in accordance with the EIA Regulations 2011 and associated guidance set out in the former Department of the Environment, Transport and the Regions (DETR) Circular 02/99. The EIA has also taken into account guidance provided within the former DETR's document 'Environmental Impact Assessment – A Guide to Procedures' (2000), and the Institute of Environmental Management & Assessment (IEMA) 'Guidelines for Environmental Impact Assessment' (2004).

- 2.4. The EIA Regulations 2011 require that before consent is granted for certain types of development, an EIA must be undertaken. The EIA Regulations 2011 set out the types of development which must always be subject to an EIA (Schedule 1) and developments which may require assessment, if they are likely to give rise to significant environmental effects (Schedule 2).
- 2.5. 'Schedule 2 development' is defined in Part 1 (2) the EIA Regulations 2011 as that where '(a) any part of the development is to be carried out in a sensitive area; or (b) any applicable threshold or criterion in the corresponding part of Column 2 of that table is respectively exceeded or met in relation to that development'.
- 2.6. The proposed development at Wreys Barton Farm falls within the criteria set out in Schedule 2 (3)(ii) of the EIA Regulations 2011, as follows:
- 'Installations for the harnessing of wind power for energy production (wind farms)', where '... (ii) the hub height of any turbine or height of any other structure exceeds 15 metres.'*
- 2.7. Specific technical guidance has been used, where appropriate, in the assessment of the impacts of the proposed development on several aspects of the environment. These include the use of British Standard methodologies and adherence to the policies set out in the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG). A summary of the relevant legislation and planning policy (national, regional and local) is provided in Chapter 3.
- 2.8. A detailed description of the assessment methodology, including the specific standards and guidelines which have been utilised during the preparation of this ES, is given at the beginning of each technical chapter (i.e. Chapters 6 - 11).

Assessment Criteria

- 2.9. In accordance with best practice guidance, a number of criteria have been used to determine whether or not the potential effects of the proposed development are considered to be significant, as follows:
- international, national and local standards;
 - relationship with planning policy;
 - sensitivity of the receiving environment;
 - reversibility and duration of effect;
 - inter-relationship between effects; and
 - the results of consultation.
- 2.10. The effects that were considered to be significant prior to mitigation are identified within the ES. The significance of these effects reflects judgement on the importance or sensitivity of the affected receptor(s) and the nature and magnitude of the predicted changes. For example, a large adverse impact on a feature or site of low importance will be of lesser significance than the same impact on a feature or site of high importance.

- 2.11. Environmental effects may be both adverse (negative) or beneficial (positive). Quantification of these effects, particularly in relation to comparative assessment between environmental disciplines, requires consistent assessment criteria to be used throughout.
- 2.12. The criteria used in this assessment are generally as follows:
- Major Beneficial or Major Adverse effect – where the development would cause a significant improvement (or deterioration) to the existing environment;
 - Moderate Beneficial or Moderate Adverse effect – where the development would cause a noticeable improvement (or deterioration) to the existing environment;
 - Minor Beneficial or Minor Adverse effect – where the development would cause a barely perceptible improvement (or deterioration) to the existing environment; and
 - Negligible – no discernible improvement or deterioration to the existing environment.
- 2.13. It should be noted, however, that certain technical studies (e.g. landscape and ecology) have slightly different assessment criteria which meet current best practice guidance for that discipline. For the sake of clarity, the specific significance criteria used in each technical assessment are set out at the beginning of the respective technical chapters in this ES.

Scope of the EIA

- 2.14. WDBC adopted an EIA Screening Opinion on 8th September 2014 (a copy of which is given as Appendix 1.2 of the ES). Based on the content of the Council's Screening Opinion and experience on the scope of similar schemes in Devon and Cornwall, the scope of this ES was defined as the topics listed in Table 1.1.
- 2.15. The findings of the EIA process, including details of any necessary mitigation measures to avoid, reduce or off-set adverse environmental effects of the proposed wind turbine are presented in the remainder of this ES.

Cumulative Sites

- 2.16. A search of WDBC, Torridge District Council and Cornwall Council's planning register was undertaken to identify a list of turbines for inclusion in a cumulative assessment. The search was limited to a radius of 10 km for other turbine applications and the list submitted with the EIA Screening Request is provided as Appendix 2.1.
- 2.17. WDBC also provided one further cumulative turbine within this radius to consider (located within the Torridge District Council boundary) and the details are provided below:
- Rexon Cross Farm, Broadwoodwidge – operational 500 kW turbine, 72 m to blade tip, located approximately 2.2 km to the north-west.

Design of the Wind Turbine Scheme (Including Alternatives)

- 2.18. The design of the wind turbine has been an iterative process which has taken account of the environmental constraints identified by the technical studies throughout the EIA process in order to minimise any adverse environmental effects of the project.

'Do Nothing' Scenario

- 2.19. As reported in RegenSW's Renewable Energy Progress Report 2013, the South West has over 1 GW of renewable energy capacity which supplies 7.3% of the South West electricity. However, the South West is not on track to meet the Governments target of 15% of South West energy from renewable sources by 2020. On the current trend, the South West will reach around 9%.
- 2.20. Therefore, the regional target is still yet to be achieved and, for the purpose of this EIA, a 'do nothing' scenario is discounted. This is because the proposed wind turbine will contribute significantly (i.e. 0.5 MW) towards the South West's renewable electricity production and, for the concomitant positive environmental benefits that this would have in terms of reducing emissions of greenhouse gases (GHGs) and the negative effects of climate change/global warming, as well as contributing to meeting the national target of 15% renewable energy supply by 2020.

Alternatives

- 2.21. The EIA Directive and the EIA Regulations 2011 do not specifically require the assessment of alternatives. The Applicant has chosen this location at Wreys Barton Farm as the land owner has willingly offered use of the site for its suitability (in terms of wind speeds, topography and distance from sensitive receptors) for a wind turbine, whilst being able to maintain the current level of agricultural use and productivity.
- 2.22. Whilst the consideration of suitable alternative sites is limited by the supply of suitable land being offered by land owners for renewable electricity generation (i.e. no other suitable sites are currently available to the Applicant in the Wreys Barton Farm area), the IEMA Guidelines for Environmental Impact Assessment (2004) describe how consideration of other 'alternatives' is equally important.
- 2.23. To this end, the Applicant has considered alternative locations for the wind turbine within the site boundary and has opted for the final location as it maximises the harnessing of available wind energy, whilst being located at a suitable distance away from sensitive receptors, including residential properties, hedgerows for breeding birds and foraging bats and public rights of way (including footpaths, bridleways and highways).
- 2.24. The Applicant has also considered alternative types of wind turbine but selected the EWT Directwind 54*500 model for its productivity, balanced with its manageability (i.e. its ability to control 'cut in speeds' etc) in order to reduce any adverse environmental effects.

3 PLANNING POLICY CONTEXT

Overview

- 3.1. The ES provides a detailed description of the relevant international, national and local legislation and planning policies that promote the development of renewable energy schemes, as part of a commitment to limit carbon and other greenhouse gas emissions and the adverse effects of climate change/global warming.
- 3.2. A package of measures to establish a new energy policy for the European Union (EU) came into force in 2007. The package sets out what have become known as the '20-20-20' targets for climate and energy to be achieved by 2020.
- 3.3. To reflect the significance placed on renewable energy, the European Commission published a Renewable Energy Directive in 2009 (2009/28/EC) which sets out the proportion of energy consumption that each member state should derive from renewable energy sources, in order that the EU (overall) derives 20% of the energy it consumes by 2020 (as per the 20-20-20 target above). Under this Directive, the UK is committed to produce 15% of the electricity that it consumes by renewable energy sources by 2020.
- 3.4. The UK Government endorses the current legislative and national planning policy framework for limiting carbon emissions and the adverse effects of global warming. It is also committed to meeting extant targets for increasing the proportion of UK energy to be produced by renewable sources including onshore wind.
- 3.5. The UK Government published its National Planning Policy Framework (NPPF) in March 2012 which sets out the planning policies for England and how these are expected to be applied. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.
- 3.6. The NPPF includes twelve 'Core Planning Principles', the sixth principle being to:

"...support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources (for example by the development of renewable energy)..."
- 3.7. Paragraph 97 (third bullet) of the NPPF states that:

"To help increase the use and supply of renewable and low carbon energy, local planning authorities should recognise the responsibility on all communities to contribute to energy generation from renewable or low carbon sources. They should:

-
- *consider identifying suitable areas for renewable and low carbon energy sources and supporting infrastructure, where this would help secure the development of such sources...*
- 3.8. Furthermore, Paragraph 98 of the NPPF states that *“When determining planning applications, local planning authorities should:*
- *not require applicants for energy development to demonstrate the overall need for renewable or low carbon energy and also recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and*
 - *approve the application (unless material considerations indicate otherwise) if its impacts are (or can be made) acceptable.”*
- 3.9. The WDBC Development Plan contains the policies to manage development in the Borough and is made up of the following adopted plans: the 2011 Core Strategy; a proposals map, settlement map; and the 2005 Local Plan Review (as amended 2011). The Local Plan was originally adopted in March 2005; however, some policies have been deleted or replaced by policies in the Core Strategy, which was formally adopted on the 19th April 2011. The Core Strategy sets out a number of Strategic Policies (SP), those of relevance which have been considered as part of this application are as follows:
- SP1 – Sustainable Development;
 - SP3 – Renewable Energy;
 - SP17 – Landscape Character;
 - SP18 – The Heritage and Historical Character of West Devon; and
 - SP19 – Biodiversity.

4 PROPOSED DEVELOPMENT

The Application Site

- 4.1. The application site is located at Wreys Barton Farm, Lewdown, Okehampton, Devon. It is located approximately 1.35 km north-west of Lewdown and consists of a single field which is currently in agricultural use. The site is enclosed by agricultural fields with a lake present adjacent to the western boundary (approximately 180 m to the west of the proposed turbine).
- 4.2. The proposed wind turbine would be erected within the eastern area of the field at National Grid Reference (NGR) **SX 43810 87623**. There are no public rights of way that pass through the application site (refer to Figure 1.1).

The Proposed Wind Turbine

- 4.3. It is proposed to construct a single Emergya Wind Technologies BV (EWT) *DIRECTWIND* 54*500 kilowatt (kW) wind turbine. The EWT Technical Specification for the 54*500 wind turbine is given as Appendix 1.1 of the ES. The turbine is to be used for supplying power to agricultural business with any surplus to be routed into the National Grid.
- 4.4. In summary, the EWT 54*500 is a direct drive, variable speed, pitch regulated, horizontal axis, three-bladed upwind rotor wind turbine. The wind turbine to be erected would have a maximum tip height of 77 metres (m), with a maximum hub height of 50 m and a maximum blade diameter of 54 m (each blade being 27 m in length).
- 4.5. The generator is fully integrated into the structural design of the turbine, which allows for a very compact nacelle design. The drive-train makes use of only one main bearing. All dynamically loaded interfaces from the blades to the foundations comprise sturdy flange connections with machined surfaces and are connected by high tensile pre-stressed bolt connections. The nacelle is a compact welded construction, supported on a tapered, tubular steel tower, which is coloured light grey on the exterior (RAL 7035). The wind turbine would be supported by a concrete foundation, connected by means of a cast-in tube or rod anchor. The rotor blades are made of fibreglass-reinforced epoxy and are coloured light grey (RAL 7035). The wind turbine has a complete grounding system and lightning protection.
- 4.6. The wind turbine operates automatically under all wind conditions and is controlled by an industrial Programmable Logic Controller (PLC). Therefore, the wind speed at which the turbine cuts-in can be controlled. When the wind speed reaches the cut-in power threshold, the turbine is connected to the grid by the power converter.
- 4.7. Where necessary (in case of a fault, extreme weather conditions or other operational reason), the turbine can be readily stopped by feathering of the blades to vane position (i.e. blades swivelled to 90° with respect to the rotor's rotational plane).

Construction

- 4.8. Site preparation and construction would be carried out over a 3-4 month period from planning consent. Planning for the construction of the wind turbine is necessarily broad at this stage, and may be subject to modification in later stages of development.
- 4.9. Broadly, the erection of the wind turbine would be carried in the following stages:
- site preparation and laying reinforced steel concrete base to receive foundation ring of the wind turbine;
 - delivery and setting of foundation ring of the wind turbine;
 - arrival of telescopic crane on site;
 - delivery of the components of the wind turbine, including: three blades, tower section (two loads), hub, nacelle and generator;
 - on-site assembly of wind turbine components on foundation ring; and
 - final earthing connections and commissioning.
- 4.10. It is proposed that the wind turbine would be constructed on an area of land not exceeding 1,500 m². As shown in Figure 5.1 of the ES, the concrete base would measure approximately 100 m² and any disturbed land around the base of the turbine would be reinstated to its former quality for re-use in agricultural production (i.e. the land use prior to construction of the turbine). Best practice guidance for soil reinstatement would be followed, i.e. Defra Code of Practice for the Sustainable Management of Soil on Construction Sites (September 2009).

Construction Traffic

- 4.11. The components of the wind turbine would be delivered to site from the Netherlands by Heavy Goods Vehicles (HGVs) namely articulated lorries with steering trailers, utilising the main highway network (via ferry service to cross the North Sea).
- 4.12. From the A30, construction traffic would exit at Sourton Down and follow the public highway that lies adjacent to the A30 for a small stretch. Construction traffic would continue on the public highway past Bridestow, Combebow Point, Lobhill Cross and Lewdown. After passing Downpark Cottages, construction traffic would turn right onto the Wreys Barton Farm landholding.
- 4.13. The site would be accessed through an existing gateway and a temporary haul route would be constructed across the field from the entrance point to the turbine location. The cable route for the proposed turbine will also follow the route of this access track.
- 4.14. The site would be accessed through an existing gateway and a haul route would be constructed using hardcore material across the field from the entrance point to the turbine location.

- 4.15. The Devon County Council Highway Authority would be advised of the actual number, dates and times of articulated lorry movements involved in the delivery of the turbine's component parts, once a programme has been devised following planning consent. As far as possible, care would be taken to avoid school opening and closing times, peak times and holiday periods.
- 4.16. Should any damage to the highway arise which can be attributed directly to the delivery of the wind turbine, then the Applicant would liaise with the Devon County Council's Highway Authority in order to agree and implement appropriate remedial measures.

On-Site Erection of the Wind Turbine

- 4.17. Upon delivery of the component parts of the wind turbine to the site, a specialist team of contractors would erect the wind turbine on site with the use of a telescopic crane.

Decommissioning

- 4.18. Following the end of the operational life of the wind turbine (i.e. twenty-five years after the date on which electricity generated by the wind turbine is first supplied to the national grid), it would be dismantled on site and the component parts would be transported off-site for disposal/recycling. Any above ground structures, including the concrete base and any access track, would be excavated and removed from site for disposal/re-cycling and the land (and soil thereon) would be reinstated to its former quality and returned to agricultural use.

Construction and Environmental Management

- 4.19. The ES provides a Method Statement for Construction and Environmental Management. It outlines how the Applicant proposes to erect the wind turbine during the construction phase and eventually decommission the turbine in an environmentally sensitive manner. By adhering to this outline Method Statement designed for the site, the wind turbine may be constructed without significant long-term adverse effects on the immediate and wider environment.

5 SUMMARY OF PREDICTED ENVIRONMENTAL EFFECTS

Shadow Flicker

- 5.1. Shadow flicker is “*the effect caused when an operating turbine is located between the sun and a receptor such as a dwelling. The effect occurs when the shadow of the turning blades falls over the dwelling, causing the light intensity within the rooms of the dwelling to brighten and darken*”; this causes a flickering effect to be perceived by the affected inhabitants. Likewise, when the sun shines from a specific angle behind a wind turbine, it can cause a flickering shadow on the ground which moves as the blades rotate.
- 5.2. Properties with the potential to be affected by shadow flicker have been identified by mapping the area around the proposed turbine location within a distance of ten rotor diameters (i.e. EWT 54*500 turbine blade diameter of 54 m x 10 = 540 m) and 130 degrees either side of north (the ‘shadow flicker study area’).
- 5.3. In this way, no properties were found to fall within the shadow flicker study area, as shown in Figure 6.1 of the ES, with the nearest property 60 m outside the study area. Therefore, it is considered that no shadow flicker effects would be experienced at any property within the vicinity of the turbine.
- 5.4. The proposed development is not predicted to cause photosensitive epilepsy in any prone person within the visual influence of the turbine.

Electromagnetic Interference and Aviation

- 5.5. Wind turbines can potentially interfere with communication systems that use electromagnetic waves as the transmission medium (e.g. television, radio or microwave links). The significance of the effect is largely dependent upon the design and location of the wind turbine and whether or not the turbine’s blades are rotating. Any tall structure can result in the potential disruption of electromagnetic signals, either where the development creates a ‘shadow’ or where it gives rise to a ‘reflection’.
- 5.6. A pre-planning consultation exercise has been undertaken as part of this assessment. Accordingly, relevant telecommunications and aviation organisations have been consulted with regard to existing infrastructure within and around the site as set out in Chapter 7 of the ES. The ES has determined that there are no significant risks of electromagnetic interference or any adverse effects on aviation.

Landscape and Visual Amenity

- 5.7. The LVIA chapter has considered the issues relating to landscape fabric, landscape character and visual amenity which may result from the wind turbine proposal at Wreys Barton Farm, Lewdown, Devon.

- 5.8. A review of the planning policy relevant to landscape and visual issues has been carried out including adopted West Devon Borough Council Local Plans, Devon County Council Advice Note 2, On-shore Wind Turbines and Solar Arrays and the Impact On Public Rights of Way, Revision 2020 and Dartmoor National Park Core Strategy. A review of relevant adopted District and Borough Landscape Character Assessments has also been carried out.
- 5.9. A computer generated ZTV illustrating the theoretical (or worst-case) predicted visibility of the turbine hub (50 m) and blades to tip (77 m) was prepared. This demonstrated that the primary area of theoretical visibility is contained primarily within 5 km of the proposed turbine, chiefly limited by topography. Representative viewpoint selection was based on study of the ZTV, online mapping, field analysis and following consultation with Georgina Browne, Landscape Architect at WDBC.
- 5.10. Significant effects on the Upper Tamar Tributary Valleys landscape character area were found to be extremely limited and local, these being within an area of 500 m from the proposed turbine. However, effects are not considered to be significant in the wider character area, neither would there be key effects on Dartmoor National Park. The Tamar Valley AONB is located towards the edge of the 10 km study zone with no predicted visibility.
- 5.11. A limited number of properties within 1 km of the proposed turbine are anticipated to experience significant effects. However, these do not have the potential to result in an *“unpleasantly overwhelming and unavoidable presence”* with regard to the Lavender Test. Beyond this and in the wider 1 – 5 km detailed study area, no significant effects are anticipated for residential properties due to a combination of topography and vegetation.
- 5.12. With regards to the distribution of rights of way and road routes, with the exception of a short section of the Two Castles Trail and a minor road which passes close to the proposed turbine, effects are limited for the same reasons as residential. Likewise, recreational facilities within 5 km are also anticipated to experience limited effects due to the combination of existing natural landscape features.
- 5.13. In terms of cumulative landscape and visual effects, no receptor is anticipated to experience significant effects.
- 5.14. The findings of this LVIA concurs with guidance published by Devon County Council and confirms that the host landscape character area can accommodate the proposed turbine at Wreys Barton. When taking into account the limited visual receptors within 1 km of the proposal, it has been found that the landscape and visual resource in the vicinity of the site has the capacity to accommodate the scale of development proposed.

Noise

- 5.15. Noise from wind turbine developments can occur from the operation of the turbines themselves and during the construction phase of the project. Any noise during construction is insignificant however and is generally a short-term daytime effect only.

- 5.16. Wind turbines are not noisy in absolute terms. People living near busy roads or in urban areas would not expect to hear wind turbine noise. But in the country away from roads, wind turbine noise can be audible and noise limits should be imposed to protect residential amenity. For this project, the simplified flat limit of 35 dB L_{A90} for wind speeds up to 10 m/s at 10 m height is proposed. This is the lowest limit available in the ETSU-R-97 guidance.
- 5.17. Predictions of turbine noise have been made for a candidate turbine, A EWT DW54*500 kW turbine. The ISO 9613-2 prediction method has been used with input parameters and limitations specified in the Institute of Acoustics' Good Practice Guide.
- 5.18. The predicted noise levels are comfortably within the 35 dB L_{A90} limit at all residential properties and at all wind speeds. Therefore, the noise impact of the turbine will be insignificant although it is possible that wind turbine noise will be audible under certain conditions.

Ecology and Nature Conservation

- 5.19. An ecological study has been completed to identify the habitats present within the survey area and to ascertain their value and suitability to support protected species or species of note. This has comprised a desk study and field surveys including: consultation with Devon Biodiversity records Centre, Devon Bat Group and West Devon Borough Council; review of online resources including MAGIC website, Ordnance Survey maps and Google Earth; an extended Phase 1 habitat survey; and Bat activity surveys (manual and automated static detectors at ground level). Works have been undertaken with reference to best practice guidelines.
- 5.20. The survey area comprises one field of improved grassland bounded by hedgerows to the north and south, a fence line to the east and woodland to the west. The survey area appears typical of the farmed landscape within which it lies being surrounded by pasture and arable land bisected by hedgerows with some large water bodies, a watercourse and small woodlands to the west and south. There are no buildings within 500 m of the proposed turbine. The River Thrushel lies within a wooded valley around 850 m to the west of the site and the A30 is around 1.25 km to the north of the site. Other farmsteads, small villages, watercourses and minor roads are present to the east and south of the site. The site is remote from any designated sites of nature conservation interest with the exception of Barton Patch Other Site of Wildlife Interest (OSWI), which comprises woodland and water bodies, part of which lies adjacent to the survey area's western boundary (156 m to the west of the proposed wind turbine).
- 5.21. The grassland within the survey area is species poor and of low ecological interest with little potential to support any protected species or species of note. Bats were recorded foraging along the survey area boundaries, particularly to the west. The boundary hedgerows are species rich and provide connectivity across the survey area and with the adjoining landscape; low levels of bat activity have been recorded along the hedgerows, with most passes recorded to the west of the site. The hedgerows are also suitable to support dormouse, other small mammals, breeding birds, reptiles, common amphibians and invertebrates, but any use is likely to be in combination with adjacent habitats. The

woodland along the survey area's western boundary (which forms part of the Barton Patch OSWI) supports a moderate number of foraging and commuting bats and is likely to support roosting bats. This woodland also provides further opportunities for dormouse, other small mammals, breeding birds, reptiles, common amphibians and invertebrates.

- 5.22. The construction of the wind turbine will result in the loss of a very small area of low value habitat (grassland) and will not impact on any species of note. The survey area boundaries and the species they support may be indirectly impacted through dust and noise, but the distance and short duration of the works minimises such risks. Furthermore, such risks would be managed through good working practices. No significant impacts on ecology are anticipated during the construction phase of the development.
- 5.23. The main consideration during the operational phase of the development has been bats and birds. The proposed turbine base has been sited within the most exposed part of the site at a distance of 156 m from the woodland on the survey area's western boundary, 64 m from the hedgerow along the survey area's northern boundary and 66 m from the hedgerow along the survey area's southern boundary. This will enable a 50 m buffer to be maintained between any part of the turbine in accordance with best practice. Furthermore, this location is where least bat activity was recorded (no records for the proposed turbine location). Impacts on bats and birds cannot be fully discounted, but the siting of the turbine significantly reduces the risk.

Archaeology and Cultural Heritage

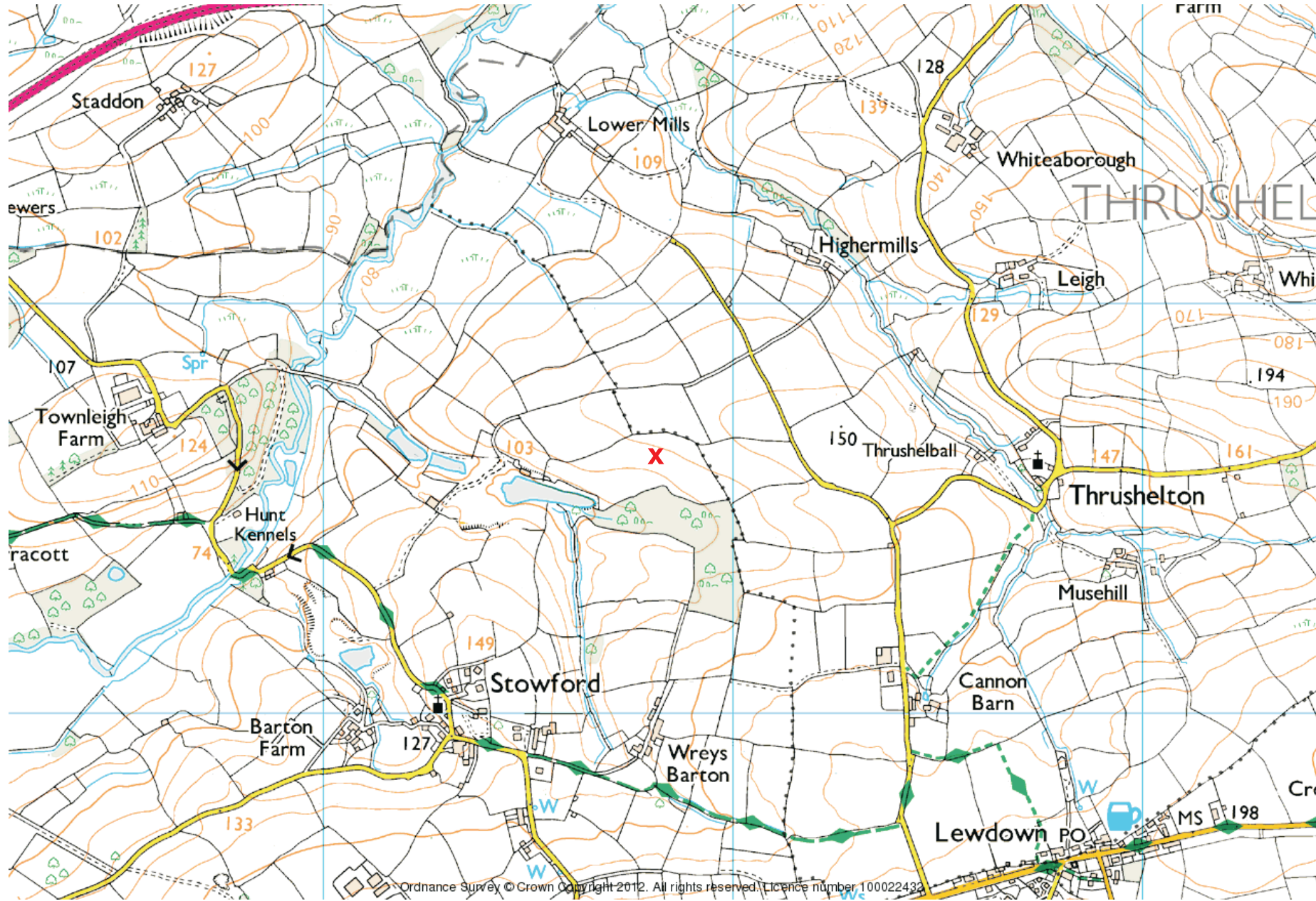
- 5.24. The proposed site lies approximately 6 km north-east of Lifton, less than 1 km east of Thrushelton and less than 1 km north-west of Stowford. The proposed turbine would be approximately 140 metres Above Ordnance Datum in an irregular shaped pasture field on the south side of a gently rising slope which leads down on the west to the River Thrushel. The soils in this area are well drained fine loamy and fine silty soils of the Denbigh 1 association (SSEW 1983), which overlie the border between two bedrock types; sandstone and mud and siltstone of the Crackington Formation (BGS 2014).
- 5.25. The place name *Wreys* is first noted in 1505 and is possibly associated with the family Stephen *le Wray* mentioned in connection with Thrushelton in 1313. It incorporates the place-name element *barton*, suggesting that it was formerly a principal farmstead on an estate (Gover *et al* 1931).
- 5.26. The site lies within an area characterised on the Devon County Historic Landscape Characterisation (HLC) as medieval farmland. Very little fieldwork has taken place in the wider area; the significant assets noted on the HER are a number of post-medieval kilns west of the site and an associated limestone quarry at the western end of the proposed turbine field, which are depicted to varying degrees on the 1st and 2nd Edition Ordnance Survey maps. Also of note are a number of medieval farmsteads in the surrounding landscape.

- 5.27. There is documentary evidence on the Tithe map and apportionment for possible earthworks to the east of the site associated with the field names *Great Castle Down* and *Little Castle Down*. However, other than the good south-east vantage point these fields possess overlooking the River Thrushel, there is currently no proven evidence of a castle-like feature or distinctive earthworks.
- 5.28. The site is bounded by mature hedgebanks with a straight eastern boundary but curvilinear north and south boundaries which run down and across the slope into the valley, with a dog-leg western boundary. Generally, there are wide views to the north, north-east and north-west up and down the Thrushelton Valley from the field. Views were confirmed to the churches of Broadwoodwidge and Bratton Clovelly.
- 5.29. There were undulations noted within the field; however, these appeared to be in line with expected contour ridges as the ground slopes to the west. There were no signs of significant below ground remains in the proposed location of the turbine, within the field in general, or along the projected route of the access track.
- 5.30. There are eight Grade I and eleven Grade II* Listed buildings or structures within 10 km of the site that fall within the ZTV, together with 27 Grade II Listed buildings or groups of buildings and 36 Scheduled Monuments. There are also two Registered Parks and Gardens, no battlefields and ten conservation areas within 10 km. There are further designated assets, primarily Grade II Listed buildings, which fall outside of the ZTV.
- 5.31. Most of the designated heritage assets in the wider area are located at such a distance as to minimise the impact of the proposed turbine or else the contribution of setting to overall significance is less important than other factors. The landscape context of many of these buildings and monuments is such that they would be partly or wholly insulated from the effects of the proposed turbine by a combination of local blocking and the topography. However, the proposed development would impact in some way on at least six of these heritage assets (**negative/minor**) and have a more pronounced impact on the Church of St. John the Baptist, Stowford House, Grange Farmhouse, Cannonbarn Farmhouse, Leigh Farmhouse, Wonnacott Farmhouse, Hayne Manor House and its Registered Park and Garden (**negative/minor to negative/moderate**). The most significant impact would be upon the Church of St. George, Thrushelton although this would constitute less than substantial harm (**negative/moderate to negative/substantial, i.e. less than substantial**). Cumulative impacts are not considered a major issue for this site.
- 5.32. The overall impact of the proposed development is assessed as **negative/moderate**, largely due to the more pronounced impact the introduction of a new visual element would have on a small number of nearby assets. The impact of the proposed development on any buried archaeological resource will be **neutral**, as the desk-based assessment and site visit identified little of merit.

6 CONCLUSIONS

- 6.1. The ES sets out the key international, national and local legislation and planning policies that provide a compelling case for the development of renewable energy schemes as part of a commitment to limit carbon and other greenhouse gas emissions and the adverse effects of climate change/global warming.
- 6.2. The ES has identified that the construction of the proposed single, 500 kW wind turbine at Wreys Barton Farm is likely to have some landscape and visual impact, although it is unlikely to significantly affect the wider rural landscape character and would not significantly harm the integrity of any key landscape characteristics or heritage assets.
- 6.3. Appropriate mitigation measures have been identified in the ES which will prevent, reduce or off-set any likely adverse effect of the proposed wind turbine on other environmental facets (including noise, shadow flicker and ecology) during the construction and operational life of the turbine. No significant adverse effects with regard to electromagnetic interference and aviation and archaeology were determined.
- 6.4. Overall, the ES has not determined any exceptional circumstances which contravene prevailing legislation or planning policy and, in this regard, the proposed wind turbine at Wreys Barton Farm should be given planning consent in order that it can contribute towards the County's and wider UK targets for producing renewable energy and reducing carbon emissions.

Figures



KEY:

X Turbine Location
Grid ref:
SX 43810 87623

Figure 1.1:
Site Location Plan

Project Name:
Wreys Barton Farm
Wind Turbine
Client:
Murex Energy

Project Number:
RMA-C1343
Date:
18th November 2014

Drawn by:
RMA Environmental/DM