MYRIAD CEG

DESIGN AND ACCESS STATEMENT/PLANNING STATEMENT

Erection of two 11kW Gaia Wind Turbines at Sycamore Farm, Oxspring

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RTPI
mediation of space · making of place

Application Overview

Site address: *Sycamore Farm, Roughbirchwood, Oxspring, Sheffield, S36 8YP*

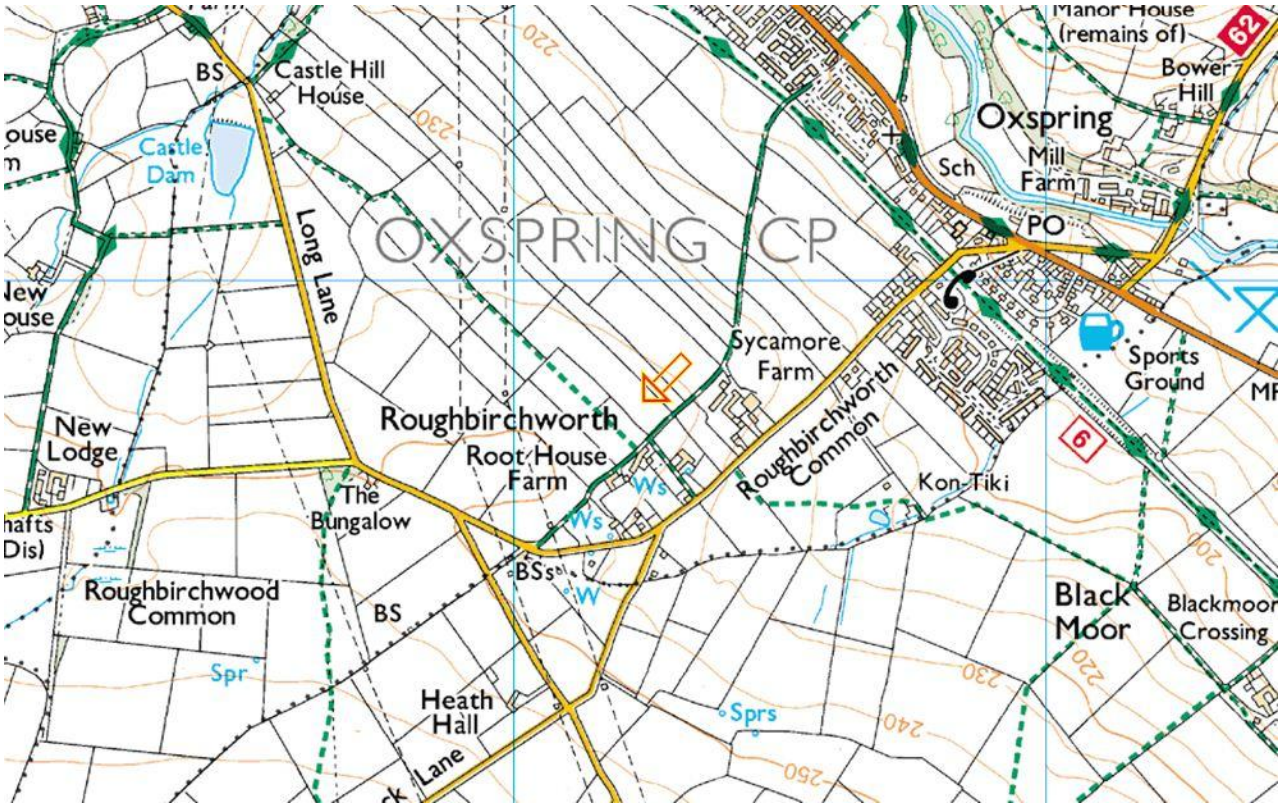
Proposal: *Installation of two 11kW Gaia wind turbines*

Turbine Specifications: *11kw wind turbine, mounted on an 18m tubular tower. The turbine is twin bladed with a blade diameter of 13m.*

Turbine locations: T1: *E426299 N401873* ***T2:*** *E426254 N401919*

Estimated annual energy generation: *47,860 kWh*

Estimated annual carbon saving: *27.19 tonnes*



This Design and Access and Planning Statement provides a comprehensive assessment of the above proposal. The statement takes into account all aspects of this installation, and its possible impacts. It is considered that the proposed installation is appropriate for the landscape in which it is set and for the purpose for which it is intended.

1. Application Description

Planning permission for two small scale 11kW Gaia wind turbines, mounted on 18m towers at Sycamore Farm is sought to enable the applicant to reduce the carbon emissions and energy bills of their property and to increase their self sufficiency in terms of electricity production.

It is estimated that the proposed turbines in this location could generate a minimum output of 47,860kWh of electricity per annum. This would cover a significant proportion of the annual energy usage at the applicants' farm. At times of low usage all excess energy is fed back to the Grid, meaning that this proposal will also benefit the wider community. This energy generation represents an annual CO_2 saving of approximately 27.19 tonnes of carbon. This installed capacity will also help to contribute towards regional and national targets for renewable energy generation for 2020.

2. Evaluation of the Site and its Characteristics

Appraising the context of the proposal has involved a site visit by a Myriad CEG Representative during which the site was walked to evaluate the landscape character and to identify site constraints. Information on background noise and wind exposure was gathered. A technical appraisal of the site was conducted. The selection of the site has been guided by the need to meet the manufacturers' requirements for available wind, avoidance of turbulence, avoidance of exposure to noise. The appraisal has indicated that the site is appropriate for the siting of the proposed wind turbines by virtue of its topography, wind characteristics and technical performance of the proposed turbines. The visibility of the site from the surrounding was assessed in terms of its potential implications for the surrounding landscape.

Small wind turbines are generally linked with a property and as such are rarely in 'prime wind' sites as sought by commercial power generators. Nevertheless, if care is taken with regard to selection and positioning, small wind turbines can make a significant contribution to greenhouse gas reduction as well as being an economically attractive proposition for the owner.

In functional terms, a turbine requires a sufficient wind speed and a supply of clean turbulence free wind in order for efficient operation. Proximity to man-made obstacles can have an impact on the effective functioning of the turbine as wind in close proximity to such structures is slower and more turbulent. It is therefore essential to ensure that the turbine is sited a sufficient distance from such structures. The application site was chosen taking this into account and is considered to be as close as is practicable to the site buildings whilst ensuring that both turbines remain efficient and un-obtrusive within the landscape.

Appraising the context of the site has involved an evaluation process that has sought to balance the various aspects of the proposal. Details of this appraisal and evaluation are included in this statement. It is considered that the site chosen and the turbine model selected satisfies the requirements of relevant local and national planning policies and in particular those relating to Built & Cultural Heritage, Public Safety and Security, Ecology and Hydrology, Landscape and Access.

3. Environmental Impact Assessment (EIA)

Wind turbines are classed as a Schedule 2 development as set out by the Town and Country Planning Environmental Impact Assessment Regulations 2011. An EIA will be required where the wind turbines are deemed by the Council to have significant effects on the environment. The likelihood of significant effect will generally depend upon the scale of the development, and its visual impact, as well as, potential noise impacts. EIA is more likely to be required for commercial developments of five or more turbines, or more than 5 MW of new generating capacity.

The proposal is for two small scale wind turbines, which are not located within a sensitive area within the meaning of the EIA regulations and it is therefore considered that an EIA is unlikely to be required in this case. A screening opinion was submitted to Barnsley Council on the 12th October 2011 to clarify this, however a response is yet to be received.

Please be advised that we welcome your comments and would appreciate the opportunity to negotiate through any points of concern during the course of the planning application.

4. Economic, Social and Environmental Benefits of the Proposed Development

In accordance with 'PPS22: Companion Guide' the economic, social and environmental benefits of this proposal should be considered as material when determining the application. The proposed wind turbines will use wind energy – this is an abundant natural resource. It is non-polluting, clean and sustainable. More specifically, it is Government policy to achieve 30% of the nation's electrical requirements from renewable sources by 2020; this proposal will help to move towards these targets.

The development will generate electricity for Sycamore Farm which is a rural enterprise and working farm. The applicant is committed to reducing their fuel costs as well as their environmental and carbon footprints. This application is an essential element in achieving this ambition.

The UK has the best wind resource in Europe. This site has a good wind speed from which the proposed 11kW Gaia turbines will produce on average 47,360kWh of electricity per year allowing the applicant to reduce both fuel bills and their carbon footprint. All excess energy, including all generation not used in peak periods versus lower demand is fed back into the Grid thus providing a wider community benefit, working directly towards the Governments regional and national targets for the supply of energy from sustainable sources.

The installation will be on agricultural land associated with the farm complex and will supply energy directly to Sycamore Farm. On this basis the project will both diversify and support the current agricultural use at the site allowing it to become more energy efficient, environmentally friendly and cost effective. There will be a significant financial saving on energy bills which in turn will support the existing agricultural use helping to sustain its future growth and development. As

such the installation of the turbine at the site can also be classed as a type of farm diversification project which is be encouraged by PPS7.

5. Site Location

The application site is located to the west of Oxspring, approximately 0.7km from the centre of the village. The market town of Penistone lies to the north west of the application site, approximately 2.1km away. The proposed turbines are set within an agricultural field to the north west of Sycamore Farm.

Turbine 1 is approximately 125m from the farmyard, with Turbine 2 approximately 185m away. The surrounding landscape is generally rural in nature, although two lines of pylons cross the area in a north-south alignment, to the west of the turbine locations. The surrounding topography is undulating in nature, a feature that shall help to minimise the visual impact of the proposed turbines.

The nearest applicant owned residential property is approximately 185m to the southeast of the nearest turbine location. The nearest non associated residential property is approximately 200m to the south west of the application site.

The turbine locations and their position within the wider landscape are shown in Figures 1 and 2.

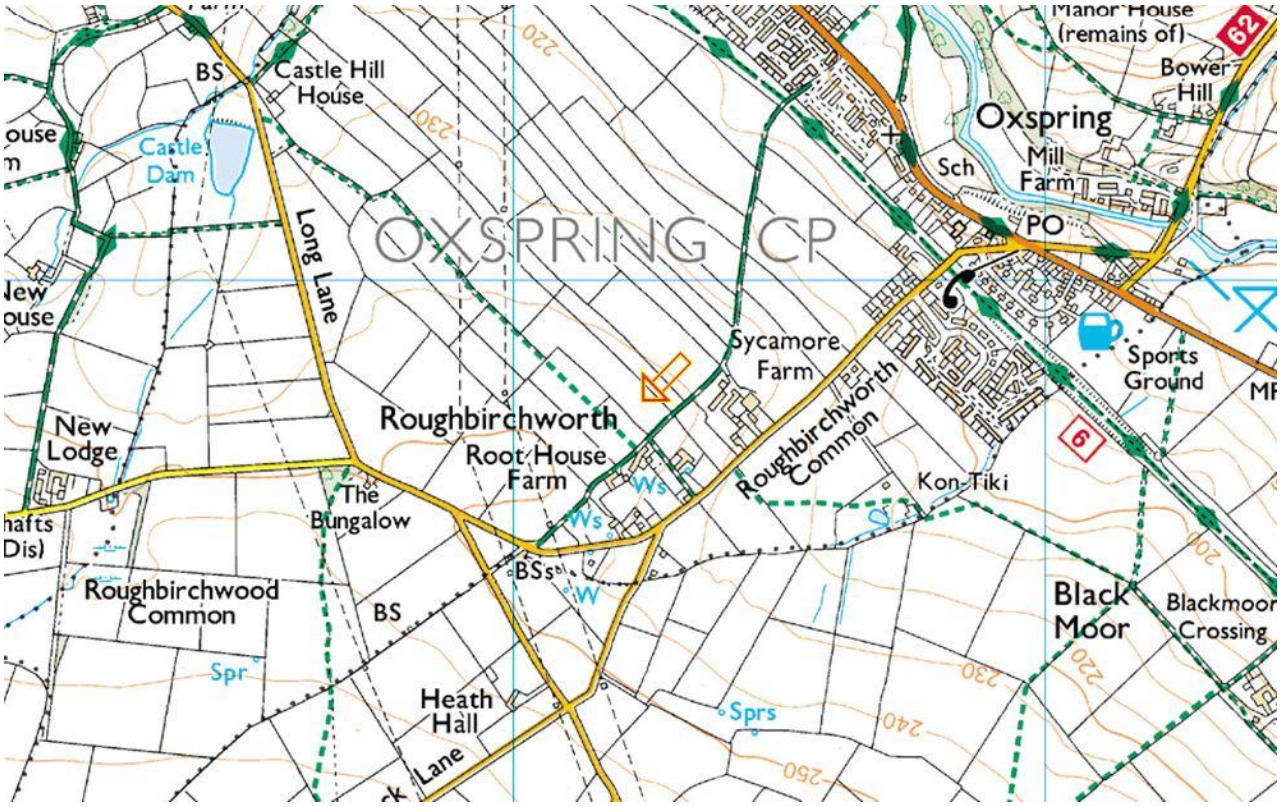


Figure 1: OS Extract 2011.

Figure 2: Aerial photograph showing the location of the proposed wind turbines (in red) (Google Earth, 2011)

There is a public footpath running to the south of the site along Back Lane, and another public footpath runs in a north westerly direction to the west of the site, approximately 170m from the turbines.

The application site lies within the Green Belt.

6. Proposal

The installation consists of two 11kW Gaia wind turbines, each mounted on an 18m galvanised steel tower on a 5m^2 concrete base. The turbine model is a twin-bladed design, manufactured as a single composite unit 13m in diameter. All non-galvanised elements of the turbine will be coloured pale grey/ off white. The tubular tower was chosen as it is considered to look less industrial than the alternative lattice tower, and so more suitable in these rural surroundings.

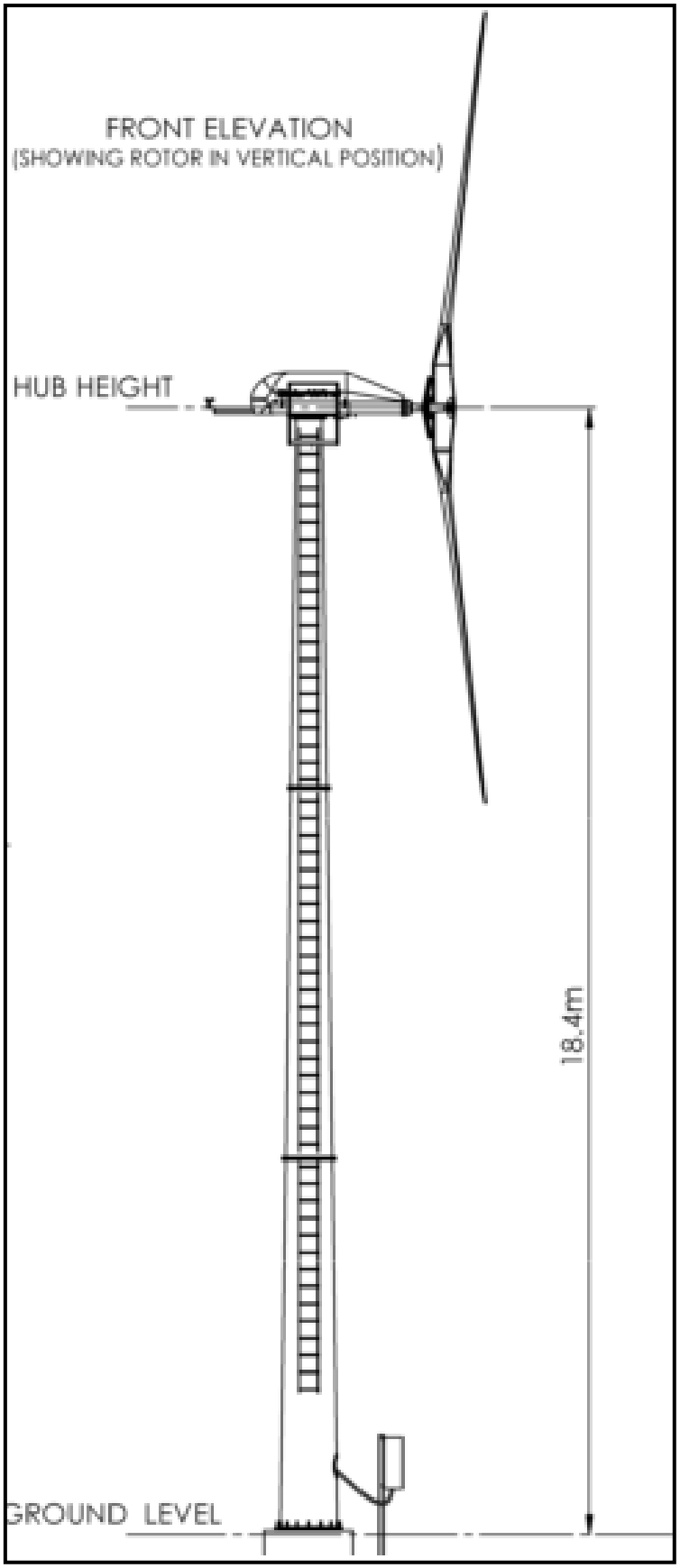


Figure 3: Gaia dimensions and technical specifications

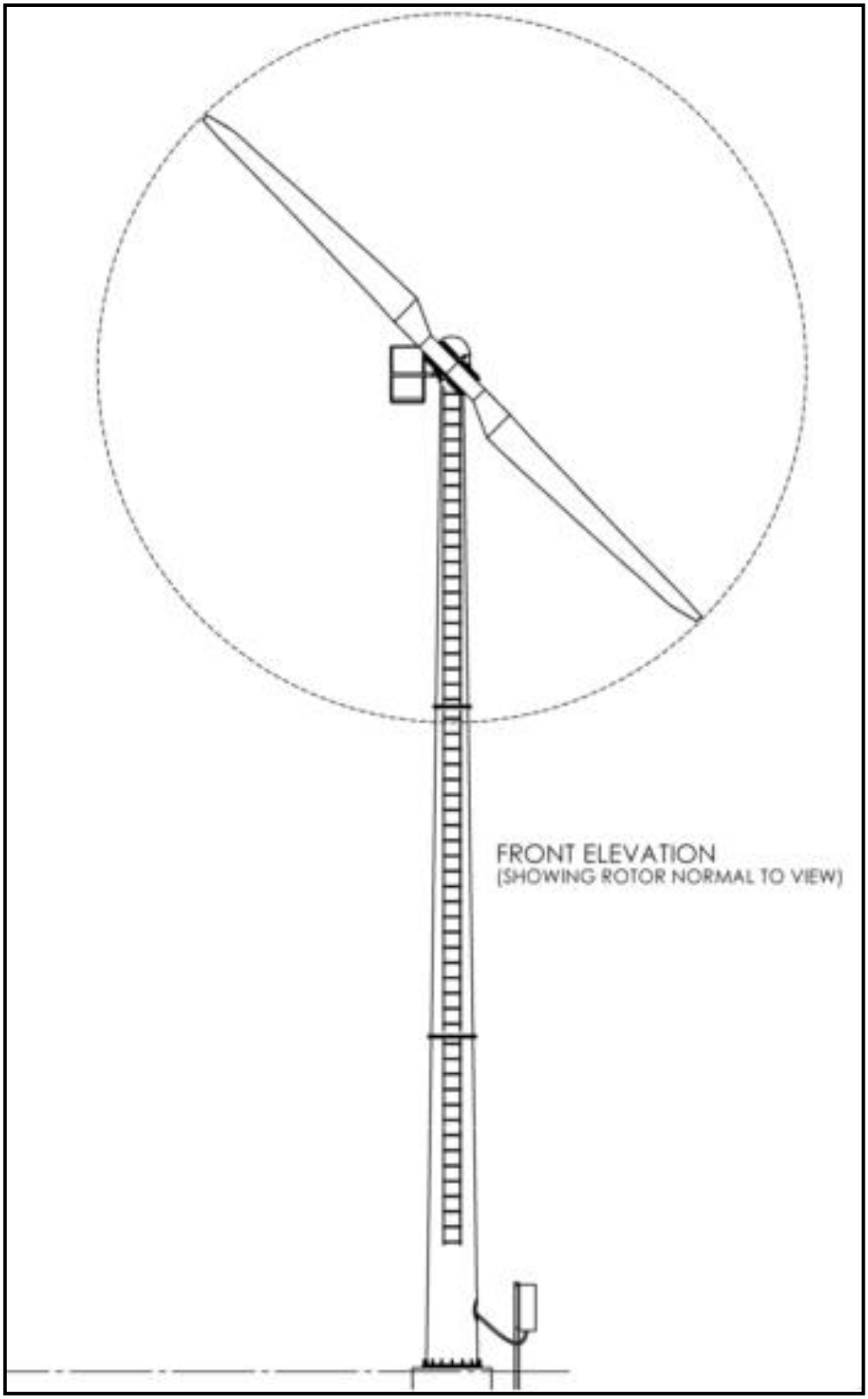


Figure 4: Gaia dimensions

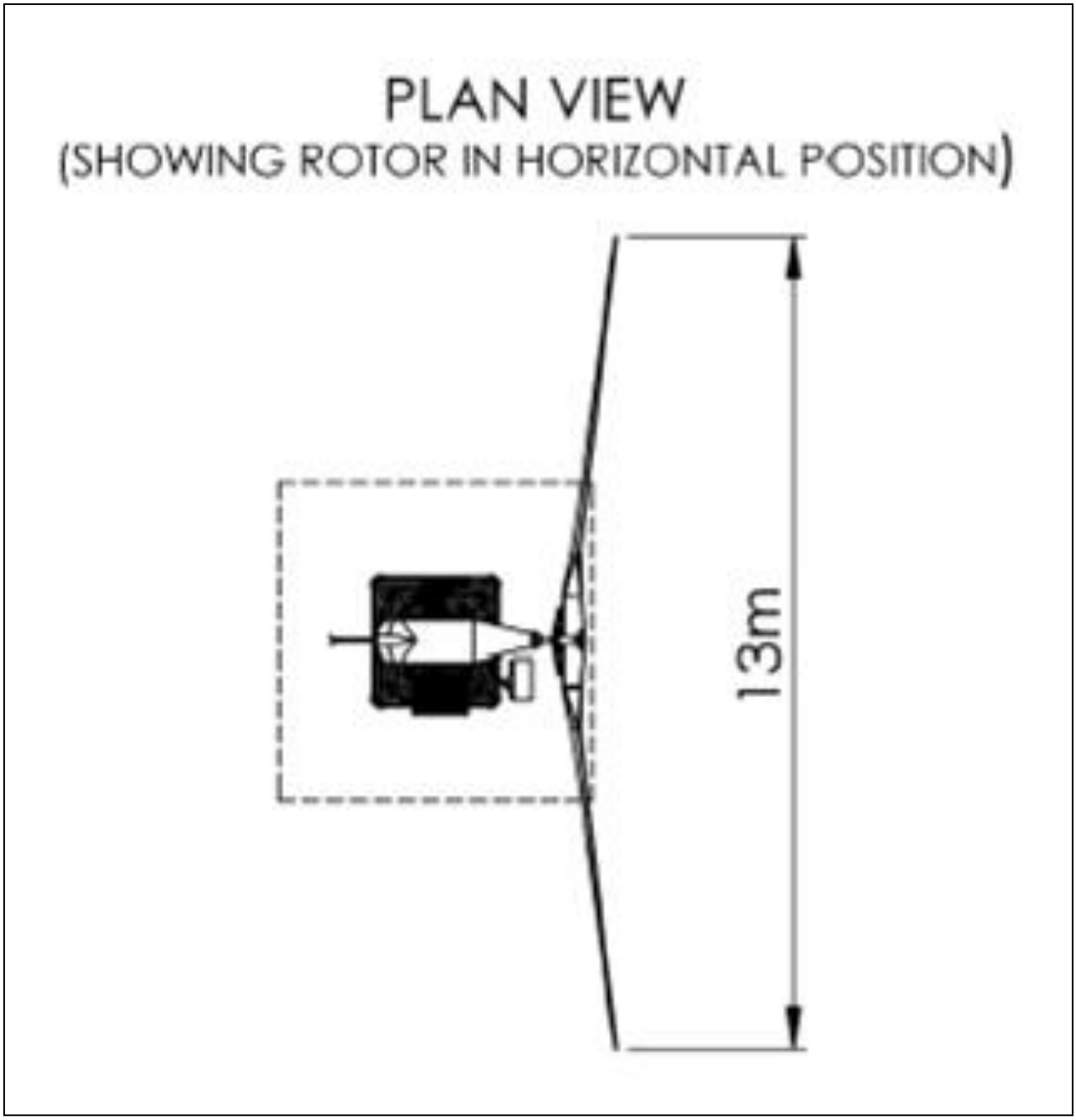
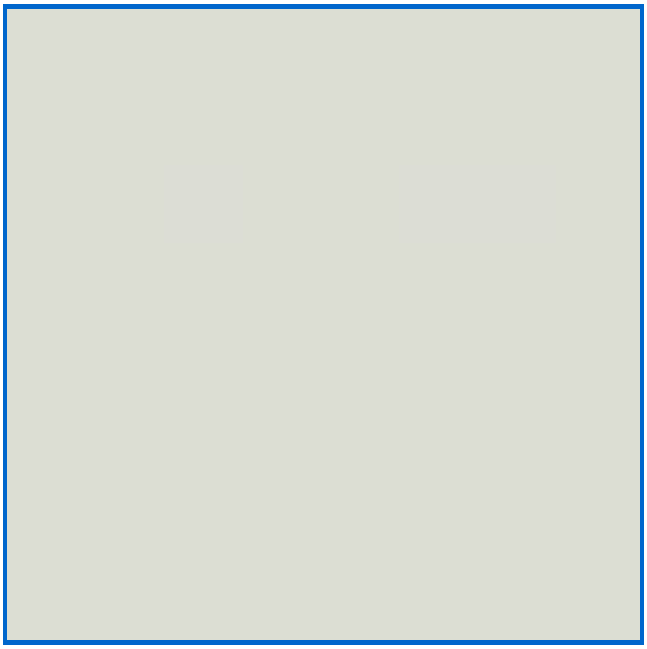


Figure 5: Cross section through the rotor showing the dimensions of the nacelle (mm)

6.1 Wind Turbine Colour

Blade and Nacelle – Finished Pale Grey/ off White RAL 9002 as shown on the colour sample panel below



RAL 9002

Mast- Finished metal grey on the colour sample panel below

Metal

Figure 6: Blade and nacelle colour

6.2 Turbine Specification

The 11kW Gaia turbine model was chosen because of its scale and slender design, which reduce the visibility over a distance. The turbine has no tail fin and only two blades as opposed to the usual three, thus making the turbine head less visually obtrusive. Also the proposal does not involve any ground based equipment housing or compound fencing. As a consequence the proposal would have a limited non material impact on the character of the landscape.

An 18m tower has been chosen for the turbines after taking into account the existing landscape characteristics as well as the energy generating capacity and efficient functioning of the turbines. On higher towers the turbines would produce more energy but could be considered to be too prominent in this location. The applicant feels that to use this technology correctly, they should opt for the most efficient turbine possible in order to achieve the greatest possible energy generation and carbon saving. The energy production from 18m towers make the wind turbines economically viable and environmentally sound in this location as it will cover more of the energy bills of the applicant and will provide a greater saving of CO_2 which in the longer term will be of greater benefit to the countryside.

As you will appreciate there are locational constraints for this type of development, including sites which are elevated or exposed, or both. It is often very difficult to completely screen mast mounted turbines from public view. However, the mere visibility of a proposal from some vantage points should not render the turbines demonstrably harmful. Where views against the skyline are possible, the scale and colouring of the turbines will considerably reduce the impact ensuring that it is within acceptable limits. Figure 7 shows how a Gaia turbine compares to the type of turbines usually found at wind farms, and electricity pylons which are commonplace in the British countryside.

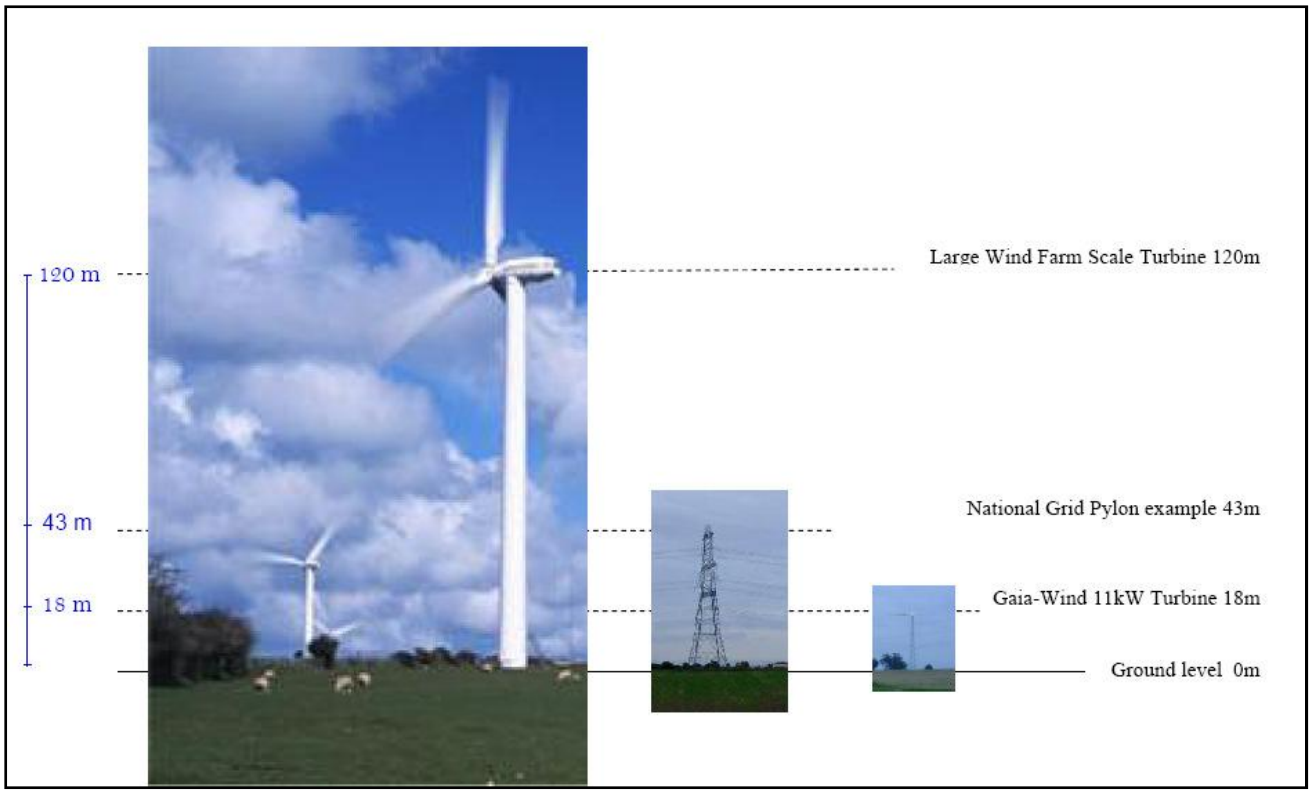


Figure 7: Height comparison diagram showing Gaia turbine in relation to other larger vertical structures found in rural areas.

7. Planning Policy Overview

7.1 National Planning Policy

Planning in England is guided by Communities and Local Government (CLG), which determines national policies on different aspects of planning, and the rules that govern the operation of the system. National planning policies are set out in new-style Planning Policy Statements (PPS), which are replacing Planning Policy Guidance Notes (PPG). These statements set out the Government's objectives in respect of planning for a whole range of issues and are used by Local Planning Authorities in formulating development plans and determining planning applications.

The following PPS are considered of particular relevance to this application and will be looked at in detail:

- PPS1: Delivering Sustainable Development, and its supplement PPS: Planning and Climate Change – Supplement to PPS 1
- PPS7: Sustainable Development in Rural Areas
- PPS22: Renewable Energy, and its Companion Guide, Planning for Renewable Energy
- Other PPS/PPG which are also relevant will be explored later in this section.

PPS1: Delivering Sustainable Development

PPS1 sets out the Government's overarching planning policies on the delivery of sustainable development through the planning system and is of relevance to all development proposals. It explicitly states that development plan policies should take account of issues such as mitigation of the effects of, and adaptation to, climate change through the reduction of greenhouse gas emissions and the use of renewable energy.

Sustainable development is the core principle underpinning planning. At the heart of sustainable development is the simple idea of ensuring a better quality of life for everyone, now and for future generations. A widely used definition was drawn up by the World Commission on Environment and Development in 1987: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The Government set out four aims for sustainable development in its 1999 strategy. These are:

- social progress which recognises the needs of everyone;
- effective protection of the environment;
- the prudent use of natural resources; and,
- the maintenance of high and stable levels of economic growth and employment.

One of the aims cited in PPS1 is that the prudent use of natural resources should be encouraged. This includes the promotion rather than restriction of the use of renewable resources by, for example, the development of renewable energy. PPS1 encourages local planning authorities to ensure that development plans contribute to global sustainability by addressing the causes and potential impacts of climate change - through policies which reduce energy use, promote the development of renewable energy resources, and take climate change impacts into account in the location and design of development.

PPS: Planning and Climate Change – Supplement to PPS 1

This PPS on climate change supplements PPS1 by setting out how planning should contribute to reducing emissions and stabilising climate change and take into account the unavoidable consequences. The document states that planning has a key role to play in tackling climate change and that "*when used positively, planning can help to create an attractive environment for innovation and for the private sector to bring forward investment, including in renewable and low-carbon technologies and supporting infrastructure.*"

With specific regard to renewable energy, this supplement states that planning authorities should provide a framework that promotes and encourages renewable and low carbon energy generation. Policies should be designed to promote and not restrict renewable and low-carbon energy and supporting infrastructure. In particular, planning authorities should:

- not require applicants for energy development to demonstrate either the overall need for renewable energy and its distribution, nor question the energy justification for why a proposal for such development must be sited in a particular location;
- ensure any local approach to protecting landscape and townscape is consistent with PPS22 and does not preclude the supply of any type of renewable energy other than in the most exceptional circumstances;
- along-side any criteria-based policy developed in line with PPS22, consider identifying suitable areas for renewable and low-carbon energy sources, and supporting infrastructure, where this would help secure the development of such sources, but in doing so take care to avoid stifling innovation including by rejecting proposals solely because they are outside areas identified for energy generation.

PPS7: Sustainable Development in Rural Areas

The policies in PPS7 relate to rural areas, including country towns and villages and the wider largely undeveloped countryside up to the fringes of larger urban areas. Amongst the Government objectives for rural areas are to raise the quality of life and the environment and to promote more sustainable patterns of development.

PPS7 states that development within the countryside should be good quality, carefully sited and accessible. The Government's overall aim is to protect the countryside for the sake of its intrinsic character and beauty, the diversity of its landscapes, heritage and wildlife, the wealth of its natural resources and so it may be enjoyed by all. In addition, all development in rural areas should be well designed and inclusive, in keeping and scale with its location, and sensitive to the character of the countryside and local distinctiveness.

In terms of development in the countryside, PPS7 states that when determining planning applications for development in the countryside, local authorities should take account of the need to protect natural resources and they should provide for the sensitive exploitation of renewable energy sources in accordance with policies set out in PPS22.

PPS22: Renewable Energy

PPS22 sets out the Government's stance on renewable energy development in England. In line with current Government targets to cut the UK's carbon emissions by 60% by 2050 and to generate 10% of all electricity using renewables by 2010, the increased development of renewable energy resources is vital.

PPS22 states that positive planning which facilitates renewable energy developments can contribute to all four elements of the Government's sustainable development strategy:

- social progress which recognises the needs of everyone – by contributing to the nation's energy needs, ensuring all homes are adequately and affordably heated;
- and providing new sources of energy in remote areas;
- effective protection of the environment – by reductions in emissions of greenhouse gases and thereby reducing the potential for the environment to be affected by climate change;
- prudent use of natural resources – by reducing the nation's reliance on ever diminishing supplies of fossil fuels; and,
- maintenance of high and stable levels of economic growth and employment – through the creation of jobs directly related to renewable energy developments, but also in the development of new technologies. In rural areas, renewable energy projects have the potential to play an increasingly important role in the diversification of rural economies.

Planning for Renewable Energy: A Companion Guide to PPS22

Whilst PPS22 sets out the policy context for renewable energy planning, this Companion Guide offers practical advice as to how these policies can be implemented on the ground, whilst the Technical Annex at the back of the document includes specific advice on the range of renewable energy technologies covered by PPS22.

The Guide should be read in conjunction with PPS22 and offers much needed assistance to decision makers who might be unsure about the technicalities of emerging renewable energy technologies. The Guide expands on issues such as the wider social, environmental and economic benefits of renewable energy technologies. It looks at community involvement, landscape issues, local policy formulation and issues associated with development control decisions, including information regarding EIAs, what should be included in a renewable energy development planning application, and consultation.

PPS9: Biodiversity and Geological Conservation complements but does not override other national policy and should be read in conjunction with other relevant PPS. PPS9 states that development proposals where the principal objective is to conserve or enhance biodiversity and geological conservation interests should be permitted. The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm.

PPS5: Planning and the Historic Environment is newly published in 2010, replaces PPG15: Planning and the Historic Environment and PPG16: Archaeology and Planning. The document sets out planning policies on the conservation of the historic environment and considers this environment in relation to other heritage-related consent regimes of which LPAs are responsible,

namely Listed Buildings and Conservation Areas. Those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest are called heritage assets. Some heritage assets possess a level of interest that justifies designation and particular procedures apply to decisions that involve them. This PPS also covers heritage assets that are not designated but which are of heritage interest and are thus a material planning consideration.

PPS23: Planning and Pollution Control states that any consideration of the quality of land, air or water and potential effects arising from development is capable of being a material planning consideration. Through its commitment to sustainable development, the Government attaches great importance to controlling and minimizing pollution.

PPG24: Planning and Noise guides local authority planners to use their planning powers to minimize the adverse effects of noise. The guidance outlines what considerations should be taken into account when determining applications for both noise-sensitive developments and for activities which might generate noise. It explains the concept of noise exposure categories for residential development and recommends appropriate levels for exposure to different sources of noise. It also advises on the use of conditions to minimise the impact of noise.

PPS25: Development and Flood Risk suggests that flood risk is taken into account at all stages of development to ensure that inappropriate development in risk areas does not take place. In exceptional circumstances where development in 'at risk' areas is deemed necessary, policies are in place to make sure this development is safe and ensure increased flood risk elsewhere does not occur as a result.

7.2 Local Policy Overview

Development Control decisions in this area are guided by the adopted Core Strategy, the Barnsley Education Sites DPD and the saved policies of the Unitary Development Plan. The application site lies within the Green Belt. It is also within an area of borough landscape value, however the policy relating to this, and the policy relating to wind energy generation have not been saved and so no longer form part of the development plan. The following policies are considered to be particularly relevant:

Core Strategy

Policy CSP 6 – Development that Produces Renewable Energy states that: We will allow development that produces renewable energy as long as there is no significantly harmful effect on:

- the character of the landscape and appearance of the area
- living conditions
- biodiversity, geodiversity and water quality
- heritage assets, their settings and cultural features and areas
- highway safety

- infrastructure including radar

  Proposals must be accompanied by information that shows how the local environment will be protected, and that the site will be restored when production ends.

UDP Saved Policies

Policy GS8 – Development within the Green Belt states that within the Green Belt, the construction of new buildings will not be permitted, except in very special circumstances, unless it is for the following purposes:

a) Agriculture or Forestry
b) Essential facilities for outdoor recreation, for cemeteries, or for other uses of land which preserve the openness of the Green Belt and which do not conflict with the purposes of including land in it
c) The replacement of existing dwellings in compliance with Policy GS8E.

The proposals compliance with the policies referred to above is demonstrated within the subsequent sections of this document and the accompanying Green Belt justification which sets out the very special circumstances.

8. Alternative technologies

PPS22 encourages developers to consider the opportunity for incorporating renewable energy projects in all development. The applicant initially approached Myriad CEG to explore the possibility of installing renewable energy technology at the site to help to increase the green credentials of their business, by reducing its reliance on unsustainable methods of energy production. This wish is entirely reasonable and wholly in accordance with up- to-date national planning policy and government advice. Myriad CEG supplies various forms of renewable installations including both solar PV systems and wind turbines. Before deciding that wind technology was the most appropriate for the site the following technologies were considered; solar PV panels, solar thermal panels and ground source heat pumps. The reasons for discounting these are detailed below;

8.1 Solar PV Panels

Solar PV panels generate electricity, however in this case they are not a viable option. Although some of the on-site buildings have south facing roof slopes which could be used to house PV panels, a huge amount would be needed to generate as much energy as the proposed turbines. Another option is free standing solar PV panels mounted on the ground. However, these would take up a large amount of useable land, and again a very large number would be needed to generate anywhere near the amount of electricity as the proposed turbines. Therefore this is not considered a viable option.

8.2 Solar Thermal Panels and Ground Source Heat Pumps

These types of installation would generate hot water however neither solar thermal panels nor a ground source heat pump would replace or supplement the electricity supply for the property or business whereas the wind turbines would. In the future the applicant may consider additional installations such as solar thermal panels or ground source heat pumps to further reduce the on-site dwellings reliance on grid-supplied energy generated from the burning of fossil fuels.

In conclusion, turbines and solar PV panels are designed to produce electricity, whilst solar thermal panels and ground source heat pumps produce hot water. They are complementary to electricity generating equipment and not a suitable alternative to the wind turbines in this instance. When comparing the energy demands of the site to the potential electricity generated by wind turbines and solar PV panels it is evident at this site that wind power is by far the most appropriate and that the significant energy generating capacity of the turbines is sufficient in this case to override the additional landscape impact associated with this type of installation.

9. Impact on the Landscape

9.1 Landscape Designation

The application site has no landscape designation within the Barnsley Unitary Development Plan as the policy relating to this has not been saved. Notwithstanding this, PPS 1 states Planning Authorities should ensure any approach to protecting landscape and townscape is consistent with PPS22 and does not preclude the supply of any type of renewable energy other than in the most exceptional circumstances.

9.2 Photographic survey of the site

Below are pictures taken from the site of the proposed turbines looking out across the landscape:

Site Looking N.	Site Looking NE.

Site Looking E.

Site Looking SE.

Site Looking S.

Site Looking SW.

Site Looking W.

Site Looking NW.

Figure 8: View from proposed turbine 1 site

The images above show that the application site is remote from residential properties in the vicinity of the site. The landscape topography is undulating in nature, and there are other vertical structures including pylons in the area, meaning that the proposed turbines will not stand alone in form.

9.3 Photomontages and Landscape Impact

Due to the siting and scale of this installation, the turbines would have only minimal visual impact on landscape quality, and that would be mitigated by the positive effects the turbines would have on the environment, such as the reduction in CO_2 emissions by an annual saving of over 27 tonnes of CO_2, which will contribute to a reduction in global warming, helping to sustain the integrity of the landscape in the longer term.

The photomontages below shows how the turbines will look once installed within the landscape from a range of vantage points. The map in figure 9, below, illustrates where the photographs were taken from.

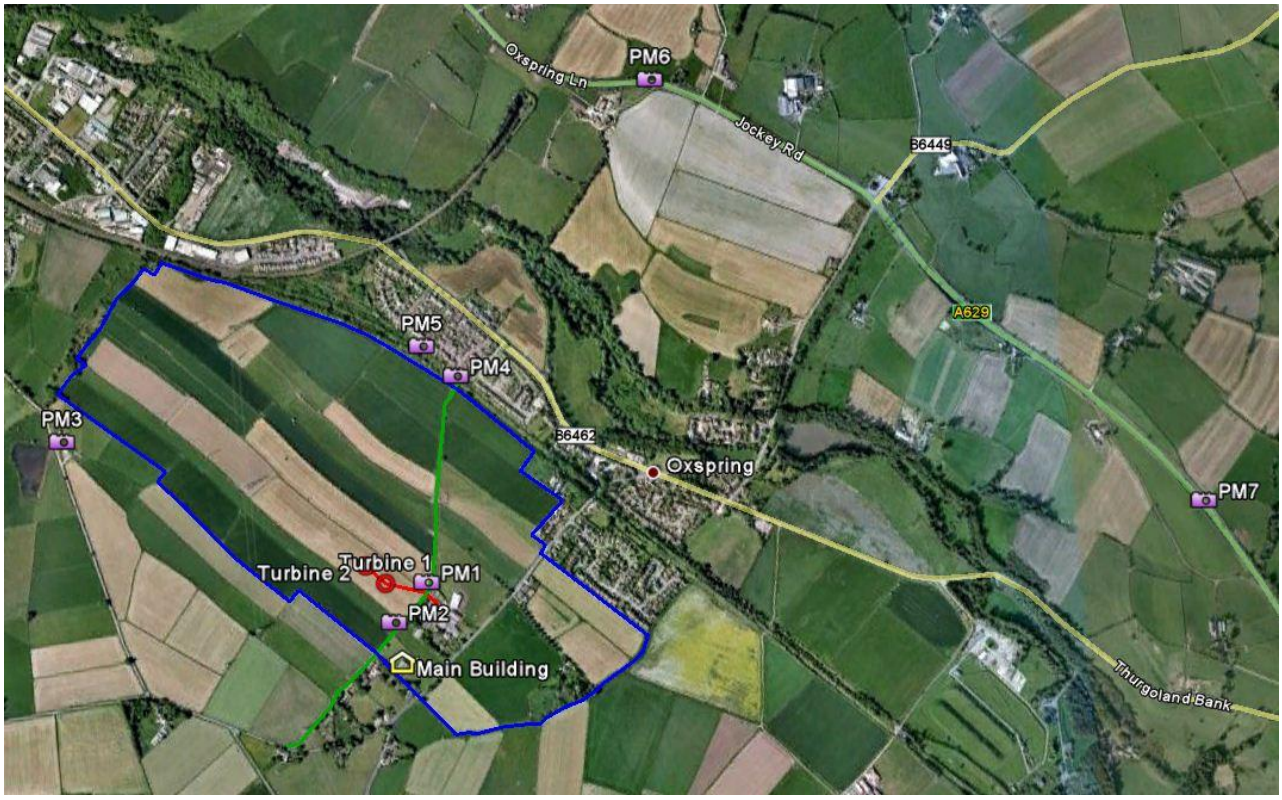


Figure 9: Google Earth Image (2011) showing the location from which the following photomontages were taken.

Figure 10: Photomontage 1 is taken from the edge of farmyard at Sycamore Farm, approximately 100m south east of the turbines. It should be noted that the turbines are coloured in white for photomontages only, in reality the masts will be galvanised metal helping it to blend more effectively with the sky.

Figure 11: Photomontage 2 is taken from Back Lane, approximately 120m to the south of the application site. Whilst the turbines are visible, they blend in well with the sky, and other vertical features in the form of electricity pylons are visible in the background, adding an element of verticality into the landscape and meaning that the turbines would not stand alone in form. The modest scale and slender design of the turbines help them to blend into the surroundings and mean that they do not appear overbearing, even in close range views.

Figure 12: Photomontage 3 shows the view from Long Lane by Castle Dam, to the north west of the turbine locations, approximately 760m away.

Figure 13: Photomontage 4 shows the view from Back Lane, approximately 480m north west of the turbines, close to the bridge over the Trans Pennine Trail.

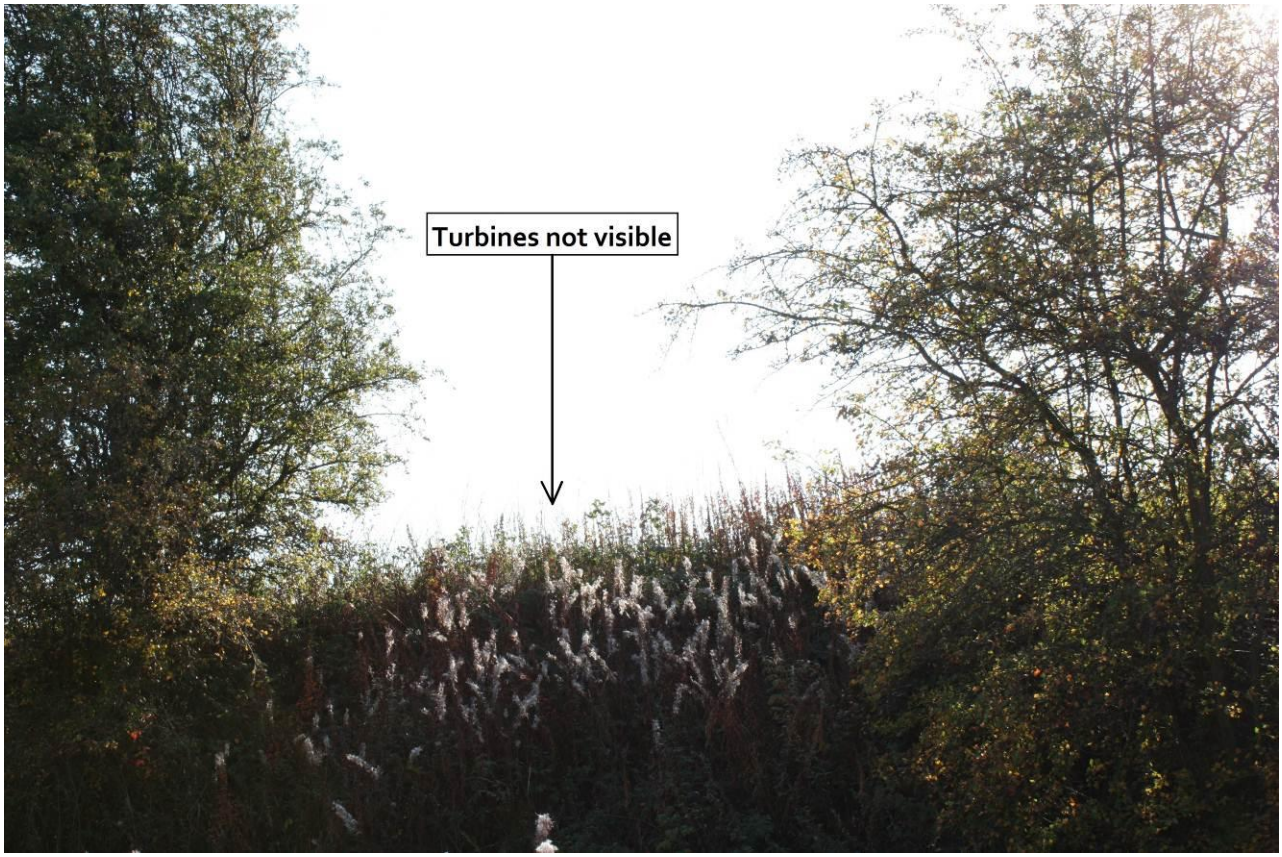


Figure 14: Photomontage 5 shows the view from the Trans Pennine Trail on the outskirts of Oxspring. The turbines are not visible from the trail as it is in cutting along this stretch.

Figure 15: Photomontage 6 is the view from the A629, approximately 1.3km north east of the application site. Even at this relatively close range, the small scale of the turbines means that they appear as minor features in the wider landscape, and they are viewed against a backdrop of rising land, meaning that they are not silhouetted against the skyline. The pylons crossing the area are much larger features, and introduce an element of verticality into the landscape, meaning that the turbines do not stand alone in form.

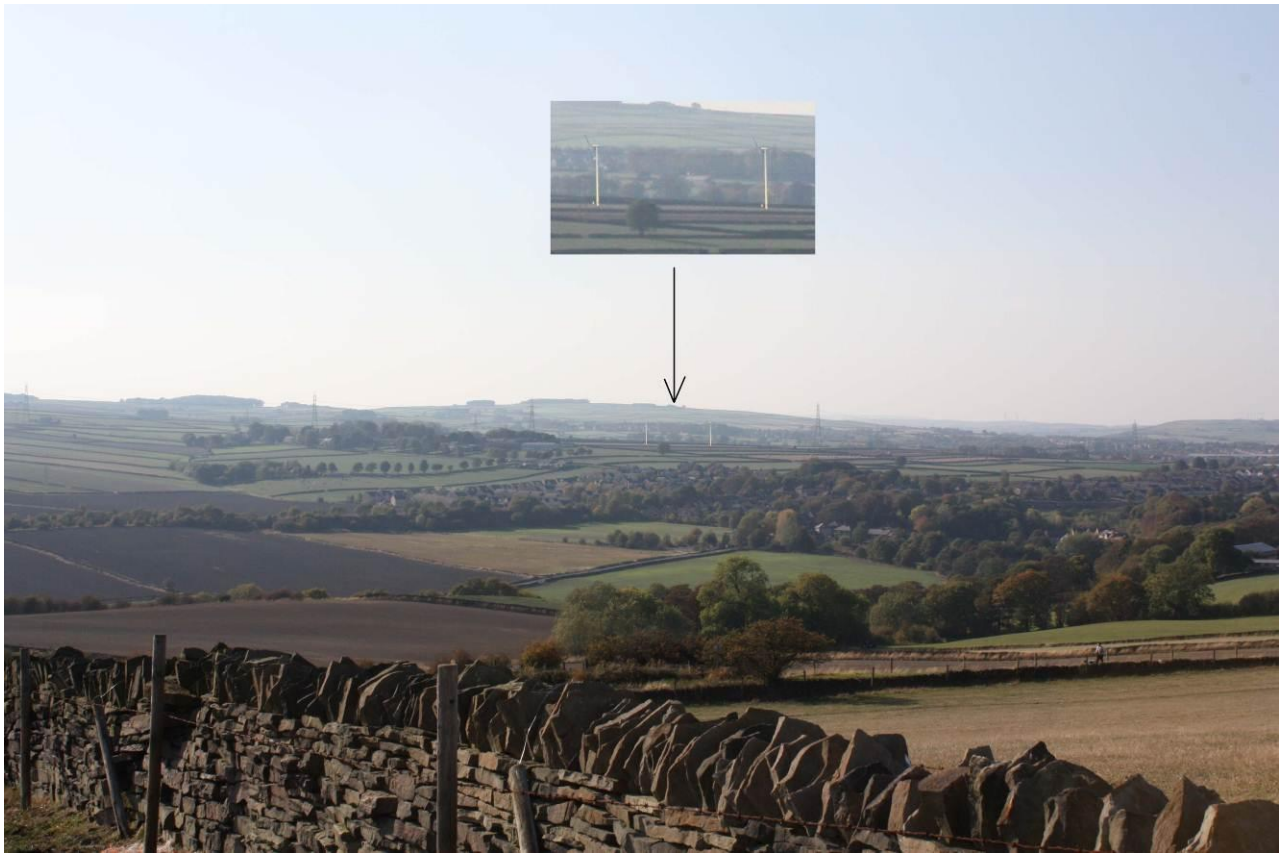


Figure 16: Photomontage 7 shows the view from the A629 approximately 2km east of the application site. At this distance the turbines are barely discernable in the distance, and are again seen against a backdrop of rising land, minimising their visual impact. At this distance the turbines would not be readily apparent to a casual observer.

Due to the size and scale of the proposed turbines no strategic views across the area will be harmed. The 11kW Gaia turbine model was chosen because the form of this turbine is considered best suited to this landscape setting and the purpose for which it is intended. The tower design, which is slender and tapers towards the top, and the colour which is proven to blend in with the sky and surrounding landscape, result in reduced visibility over both mid and long range distances. Also the proposal does not involve any ground based equipment housing or compound fencing. As a consequence the proposal would have a limited, non-material impact on the character of the landscape. Indeed, there are a large number of other vertical structures within the landscape including telegraph poles and larger electricity pylons in the area around the application site.

Taking the above factors into account, the proposal as a kinetic development would not represent a prominent or visually intrusive feature in the surrounding rural landscape; the modest scale of the turbines would only result in very modest impacts on the fabric, character and quality of this area, resulting in no harmful change to its overall character. Furthermore the turbines would not unduly interfere with the visual amenities enjoyed by neighbouring properties and the public realm, as the turbines would not dominate any one view and would only result in a slight visual interruption without resulting in a serious deterioration in the existing view.

9.5 Public Rights of Way

Figure 17 shows the roads, public footpaths and bridleways in the area around the application site.

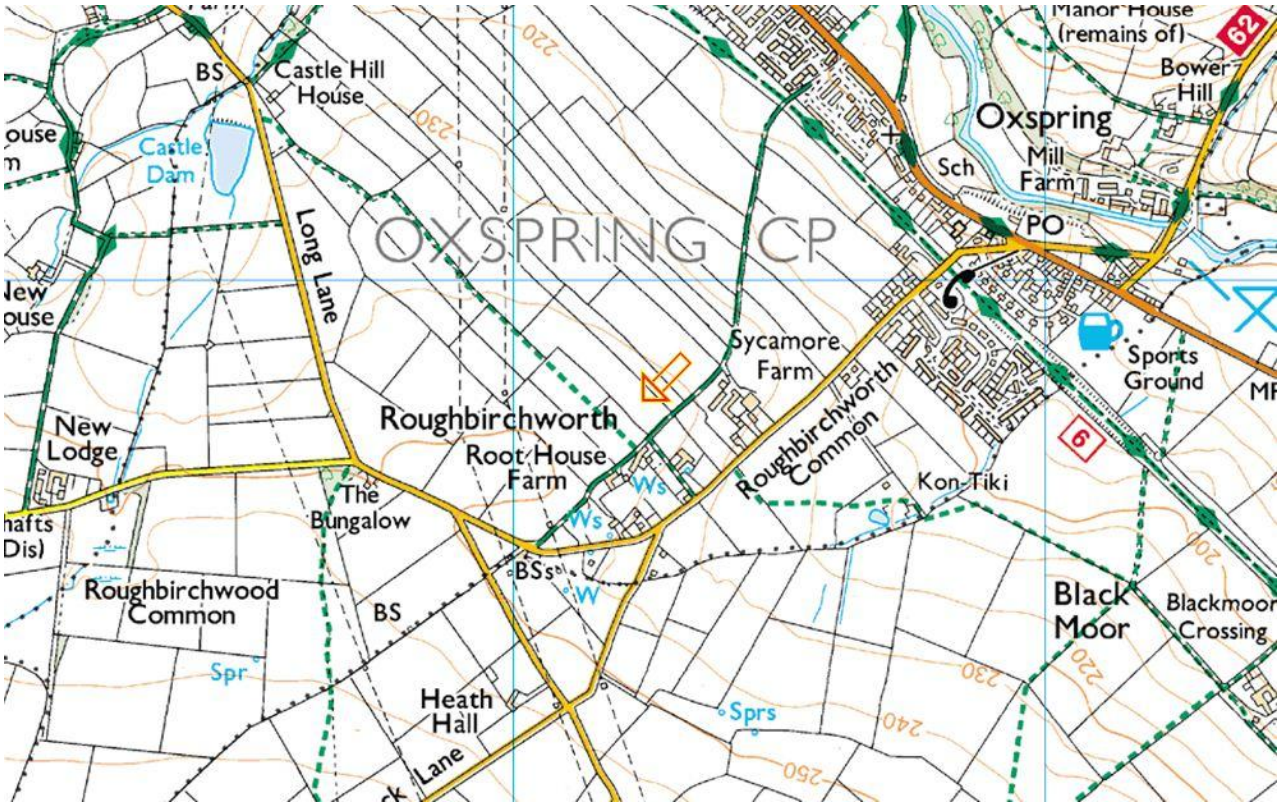


Figure 17: Public Rights of Way in the vicinity of the site

The nearest public right of way is a bridleway which runs along Back Lane to the south/south east of the application site. A public footpath runs to the west of the application site to Castle Dam. The bridleway is approximately 95m from the nearest turbine (Turbine 1) at its closest point. The public footpath to the east is approximately 170m from the turbines at its closest point. The proposed turbines would be further than fall-over distance from both of these routes and would not pose any risk to users of these routes. Whilst they would be clearly visible from both of these rights of way, they are of a modest scale, and it is considered that they would not have an over-bearing effect or adversely affect the amenity of users of the routes. Indeed they could be considered to add features of interest to the routes.

The Trans Pennine Trail runs to the east of the site, approximately 450m from the turbines. The turbines would not be visible from the Trans Pennine Trail as this section of the route is along a disused railway line, which is in cutting and benefits from large amounts of screening along the route.

There are several other public footpaths in the area from parts of which the proposed turbines may be visible along with the road network in the immediate vicinity of the application site; however mere visibility of the turbines does not render the proposal demonstrably harmful. Whilst the

installation of turbines can often provoke strong opposition, there are many people in favour of them who think that they are an attractive and positive introduction to the landscape.

PPS22 states that there is no statutory separation between a wind turbine and a public right of way. Often fall over distance is considered as an acceptable separation, and the minimum distance is often taken to be that the turbine blades should not be permitted to oversail a public right of way, both of which are achieved in this case.

In line with guidance issued by the Highways Agency, the turbines will be sited at more than 'toppling distance' from footpaths and major roads.

10. Cumulative Impact

The cumulative impact of the turbines is negligible. The proposal is for two 18m turbines which will appear as insignificant in the wider landscape. Whilst local authority searches have revealed that there are a number of wind turbine planning permissions in the wider area, the closest of these is approximately 1.5km from the application site. Given the modest scale of both developments and the separation distance involved it is considered that the cumulative impacts resulting from this would be negligible.

11. Noise

A site visit was made to identify the most suitable design and location for the turbines. The turbine sites chosen are at least 180m from all non-associated residential neighbours. The selected position provides adequate exposure to the prevailing wind and minimises the risk of turbulence. The site has been appropriately specified, designed and located to allow sufficient distance between the wind generator and any existing noise sensitive development so that noise from the wind generator will not be a nuisance or a material consideration in deciding the planning application. In practice turbine noise is often masked by background noise such as wind, leaves rustling, traffic noise etc.

There are two quite distinct types of noise source within a wind turbine - the mechanical noise produced by the gearbox, generator and other parts of the drive train and the aerodynamic noise produced by the passage of the blades through the air. However noise levels from Gaia wind turbines are amongst the quietest in its class (the aerodynamic noise of a turbine increases exponentially with an increase in the rotational speed) and, under most operating conditions, it is likely that turbine noise would be completely masked by wind-generated background noise.

The report "The Assessment and Rating of Noise from Wind Farms" (ETSU-R-97), describes a framework for the measurement of wind farm noise and gives indicative noise levels calculated to offer a reasonable degree of protection to wind turbine neighbours, without placing unreasonable restrictions on wind turbine development or adding unduly to the costs and administrative burdens on wind turbine developers or planning authorities. The report presents the findings of a cross-

interest Noise Working Group and makes a series of recommendations that can be regarded as relevant guidance on good practice. PPS22 sets out that the ETSU-R-97 guidance is the guidance which should be applied when assessing wind turbine developments.

The ETSU-R-97 Guidance recommends that in most cases the fixed noise limit for night time is 43dB (A) is acceptable. This limit is derived from 35dB (A) sleep disturbance criteria referred to in Planning Policy Guidance Note 24. An allowance of 10dB (A) is made for attenuation through an open window (free-field to internal) and 2dB subtracted to account for use of LA90 10min rather than LAeq 10 min. They also recommend noise emission of the turbines in relation to a neighbour's outdoor sitting area in the open countryside should be no higher than 40 dB (A) at any noise sensitive properties. It must be noted that ETSU-R-97 also advocates that considerations should be given to increasing the permissible margin above background where the occupier of the site has some financial involvement in the wind turbine meaning that it can be acceptable to have higher noise readings where the applicant's property is the primary affected residence.

The noise emission report for the Gaia 11kW turbine in figure 18 contains a summary of measurements. The report records noise measurements for the Gaia 11 kW turbine in order to determine the sound level of the turbine. Measurements of the noise emissions from the Gaia turbine were taken on 20/01/2006 between the hours of 12pm and 2:30pm, see table below. As advocated by the Noise Working Group noise emission of the turbine in relation to a neighbour's outdoor sitting area in the open countryside should be no higher than 40 dB (A) at any noise sensitive properties.

As can be seen from the submitted noise readings at 180m the noise from the turbines is 35dB(A) well below the usual 43 dB (A) night time requirement at noise sensitive premises, and the 40dB(A) daytime requirement for outdoor seating areas which is achieved at just 100m from the turbines. In conclusion the noise levels of this wind generator is low and under most operating conditions it is likely that the micro wind generator noise would be completely masked by the background noise from the wind blowing through the trees and buildings and from traffic on the roads around the site.

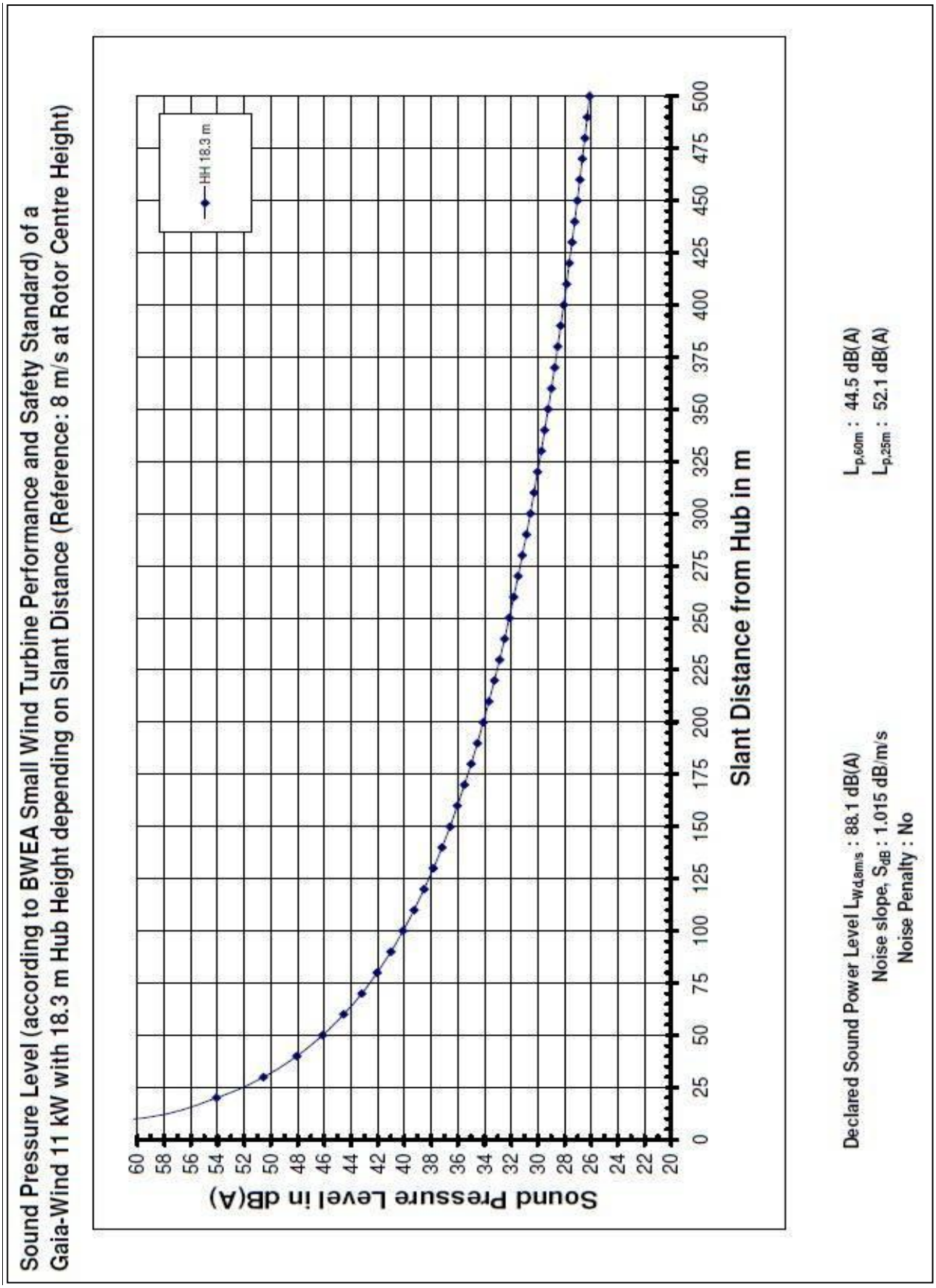


Figure 18: Gaia noise emissions

12. Shadow flicker

Shadow flicker is the name given to the effect that may arise when turbine blades rotate in bright sunlight conditions, casting shadows within rooms of buildings. PPS22 companion guide states shadow flicker can theoretically affect observers up to 10 rotor diameters from the turbine who are north, east or west of the turbine. It is usually more of a problem in winter, when the sun is lower in the sky and of course it is only a problem on sunny days. Shadow flicker is more likely to cause sufficient variation in luminance when perceived indoors through narrow window openings. In outdoors areas shadow flicker is less likely to be perceived unless light influx is limited to one direction, for example within an enclosed courtyard.

The Gaia turbine has a rotor diameter of 13m therefore consideration should be given to the impact of shadow flicker on residential properties within 130m north, east and west of each turbine. Site investigations have revealed that there are no residential properties or other buildings within this zone therefore shadow flicker will not be a material consideration in this case.

13. Electro-magnetic Interference and Aviation

13.1 Electromagnetic Interference

PPS 22, section 8.64 states that "Provided careful attention is paid to siting, wind turbines should not cause any significant problems of electromagnetic interference".

The proposed model of wind turbine uses a permanent magnet brushless alternator and thereby avoids one main source of potential electromagnetic interference, worn brushes. The other common source of electromagnetic interference is the switching circuitry used in the controller and inverter to adjust the turbine's loading. This equipment will be fully tested to ensure full compliance with industry standards.

Scattering of signal is a phenomenon that very occasionally may affect large utility scale turbines. It is not considered to be relevant to turbines as small as that proposed in this case. Furthermore between the years of 2008 and 2012 the government is planning to update the UK's transmission network and provide digital viewing for all. Once this takes place, television signal interference will no longer be of concern as digital signals will not be subject to electromagnetic interference. The Digital Switchover for the area in which the application site falls has already taken place.

13.2 Communications

From experience it is noted that turbines of this scale rarely interfere with communications infrastructure. However, for completeness Ofcom have been consulted and their response shall be forwarded on as part of the planning application.

13.3 Aviation

Neither the application site nor the scale and design of the wind turbines are covered by any known restrictions currently in force by the Ministry of Defence. However, for completeness and in

line with guidance in PPS22, a developer pro-forma outlining the scheme has been completed and sent to the MoD. Their response will be forwarded to the Local Planning Authority as soon as they are received.

Both the National Air Traffic Service (NATS) and the Civil Aviation Authority (CAA) do not respond to developer enquiries and will therefore need to be consulted by the Local Planning Authority if necessary.

14. Ecology and Conservation

As highlighted through PPS22, the greatest threat to all living species is climate change resulting from carbon emissions. Whilst there is little data available on the risk to wildlife by small wind turbines, it is too easy to impose requirements appropriate to industrial scale machines.

The land immediately surrounding the application site for the proposed turbines is agricultural land and this use would continue following the erection of the turbines. As a result the direct habitat loss as a result of the proposal would be negligible. Figure 19, is taken from Natural England's Interactive Map (http://www.natureonthemap.org.uk) and shows sites which are protected because they have special wildlife interest. There are no designated sites in the vicinity of the application site. The nearest is a SSSI at Spring Meadows, Alderman's Head & Cow Croft Meadows over 3km from the application site.

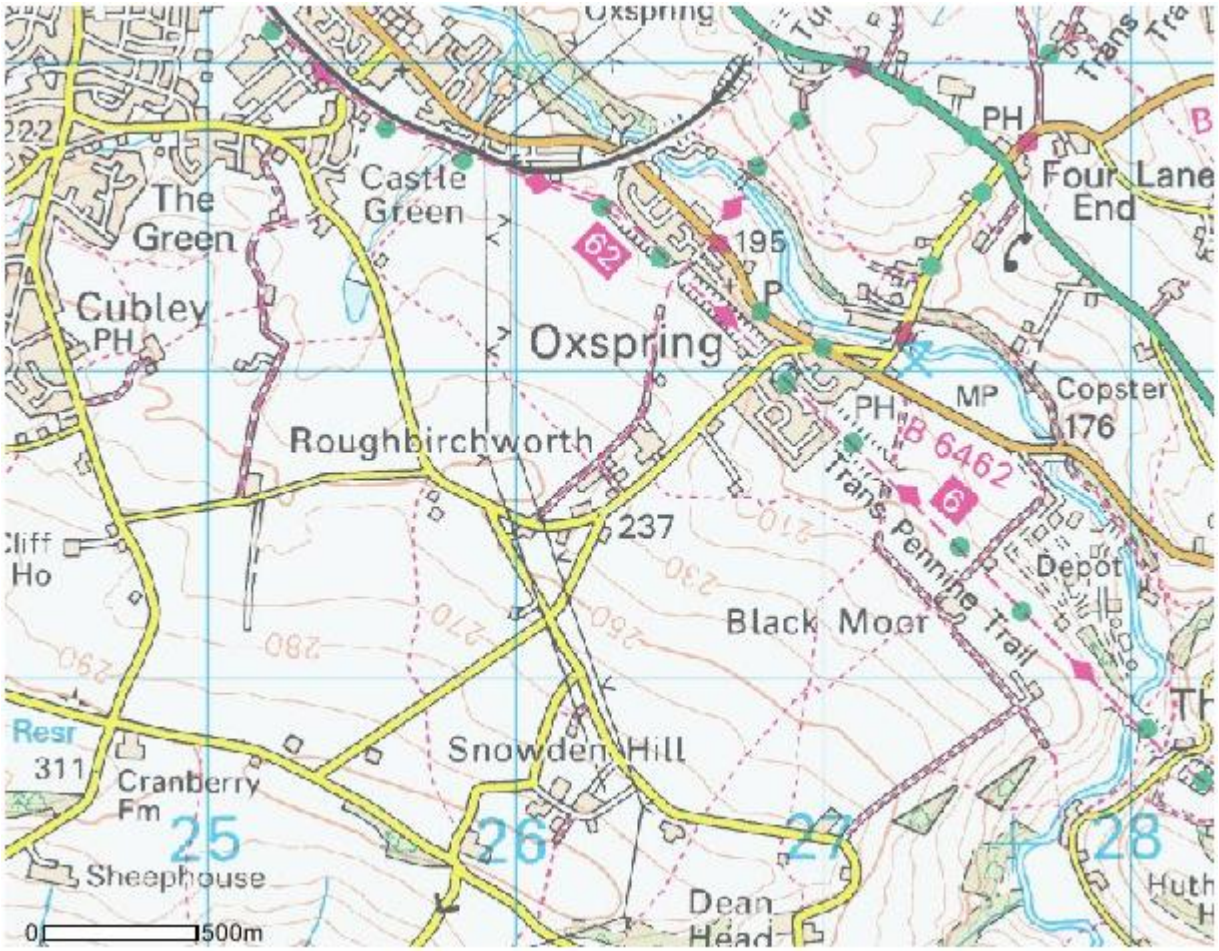


Figure 19: Site in relation to Ecology Sites (Natural England, Accessed 2011)

14.1 Designated Wildlife Sites

The above image shows that the proposed application site is not within or adjacent to any sites designated for their wildlife interest. The nearest designated site is Spring Meadows, Alderman's Head & Cow Croft Meadows, approximately 3.3km south west of the proposed turbines, which is a SSSI. This site is designated for its areas of species rich unimproved neutral grassland. The site is of national importance and comprises a fairly wet assemblage of grasses and herbs characterised by crested dog's tail and common knapweed.

In view of the small scale of the proposed turbines, the nature of the designated site and the separation distance, the development would not impact upon the designated site.

The closest site designated for its importance to birds are the Peak District Moors, a SSSI, SPA and SAC, the closest boundary of which is over 4.5km from the application site. In view of the small scale of the proposal and the separation distance involved, the development would not adversely affect this site.

Taking the above into account the proposed construction and operation of the wind turbines can be carried out without having an adverse impact on local bird populations.

The British Wind Energy Association Website (http://www.bwea.com) states that, "Experience and careful monitoring by independent experts shows that birds are unlikely to be damaged by the moving blades of micro wind generators". More information about this can be found from BWEA Best Practice Guidelines and the Royal Society for the Protection of Birds, whose view is that, "Climate change is the most significant, long-term threat to biodiversity worldwide. To help meet this threat, the RSPB also strongly supports moves to increase energy efficiency, reduce energy demand and supply more of our energy needs from renewable sources, including wind power, provided they do not harm birds or their habitats." Studies of birds increasingly show that the risk from wind turbines to most species is very low, far greater risk exists from overhead cables and moving cars. The RSPB have installed a small wind turbine at their visitor centre at Rainham Marshes and are reported to be considering turbines for other sites including turbines for a site near to Carlisle. The RSPB position on wind turbine installations is illustrated here: http://www.rspb.org.uk/news/details.asp?id=tcm:9-213213.

14.2 Bats

General advice from the Bat Conservation Trust and the Wildlife Trust regarding domestic scale installations on other similar turbine applications states is that it is good practice for the siting of turbines to avoid close proximity to buildings that could be used as roosts, or groups of mature trees, hedge lines and water bodies such as ponds and lakes, which could be used as foraging and commuting routes. They recommend siting of turbines 50m away from any such feature. This advice is backed up by English Nature in their 2009 publication Technical Advice note TON051. For this reason care has been taken to locate the turbines more than the minimum recommended distance of 50m from nearest blade tip to bat habitat/feeding areas of woodland, hedgerows, buildings and water.

In addition however it is material that the Advice in TON051 makes no differentiation between large scale wind farm development and small turbine development. We have experience of many instances where separation distances of as little as 30m have been considered sufficient by Natural England. In view of the scale of the turbines and the separation distances involved, along with the exposed nature of the site, the potential impact of the development on bat populations is considered to be low.

14.3 Hydrology

The local hydrology including main rivers, private watercourses or Ground Water Protection Zones will not be materially affected by the installation of the concrete pads to support the micro wind generators. The area around the concrete bases of the turbines will also be unaffected by the wind turbines. There are no impacts predicted on any ground living mammals or any plants or invertebrates. Any grass sods removed during excavation of the foundations for the two $5m^2$ concrete bases will be removed and set aside prior to excavation and then replaced on completion of the base. Any surplus soil will also be deposited and levelled on site, the whole site being left in a fully reinstated condition.

There are no watercourses in the vicinity of the application site which could be affected by the proposal. The site is not located within a flood zone in accordance with the Environment Agency Flood Map as shown in figure 20.

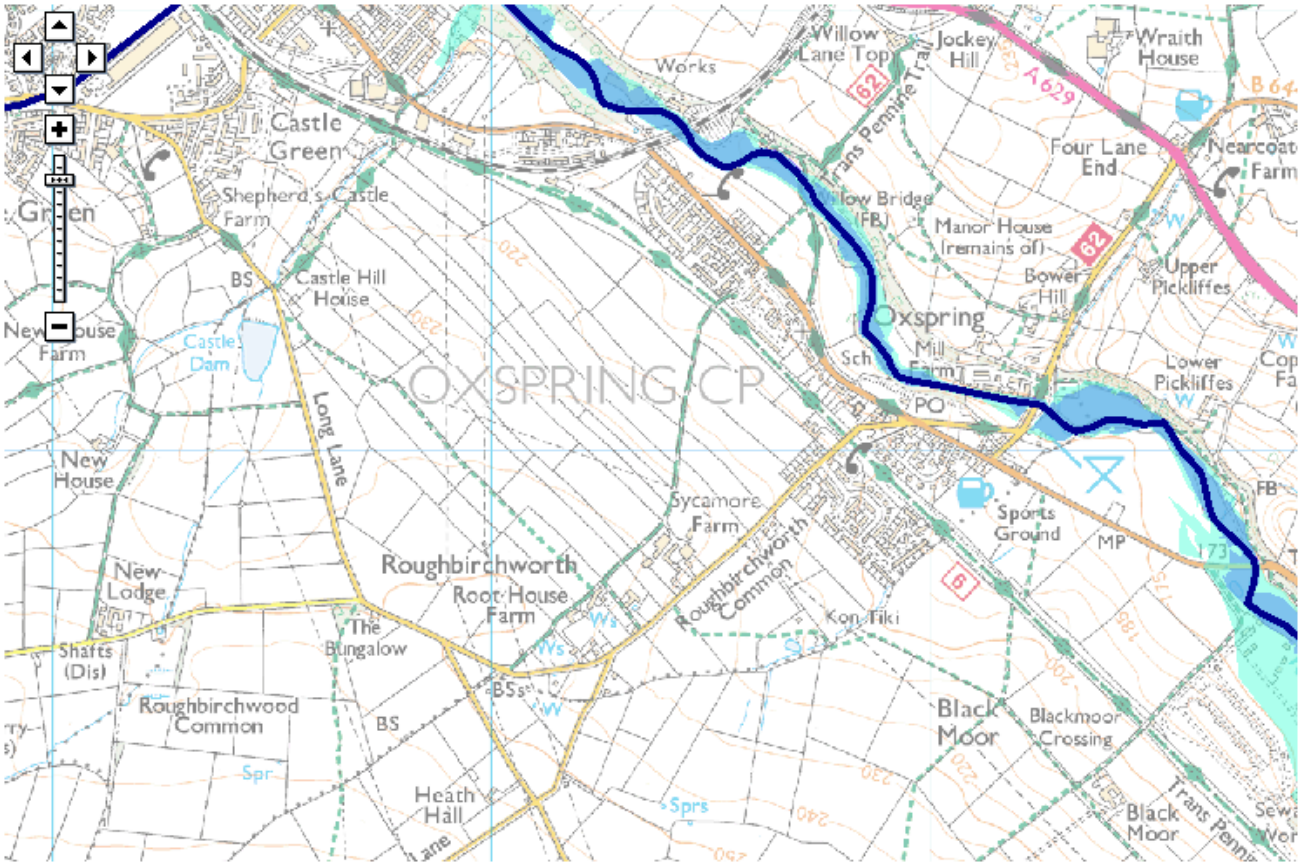


Figure 20: Location of site in the Flood Map (Environment Agency Flood Map, Accessed 2011)

15. Heritage

English Heritage accept that on the basis of the most widely accepted predictions, future climate change is likely to be detrimental to the historic environment. Despite the fact that most historic buildings, sites and landscapes have experienced a changing climate in the past, many may be at risk, together with the important contribution they make to the UK economy. For example higher temperatures, drier summers, changing patterns of vegetation and altered distributions for pests and disease may pose significant challenges for the long-term maintenance of historic landscapes, including designed landscapes such as conservation areas. It is therefore accepted the renewable technology has a place within historic landscapes.

With regard to heritage assets within the immediate vicinity, we have carried out a desk based assessment to firstly establish whether there are any cultural heritage impacts associated with the development and secondly to determine the significance of the impact once identified.

The assessment took to form via local record searches which comprised the following:

- A review of local OS maps;
- English Heritage National Monuments Record on the Images of England website http://www.imagesofengland.org.uk/;
- British Listed Buildings Online http://www.britishlistedbuildings.co.uk/
- Heritage Gateway Website http://www.heritagegateway.org.uk/Gateway/advanced_search.aspx;
- PastScape http://www.pastscape.org.uk/mapsearch.aspx; and
- Magic Map http://www.magic.gov.uk/website/magic/

The searches have identified that there are no Listed Buildings in the vicinity of the application site. The nearest listed building is the Oxspring Bridge over the River Don at the opposite side of Oxspring, over 1km from the application site. In view of the small scale of the proposed turbines, the separation distances involved and the screening in the surrounding environment, the development would not impact upon the setting of any listed buildings.

In PPS5: Planning for the Historic Environment it states that "Local Planning Authorities should identify opportunities to mitigate, and adapt to, the effects of climate change when devising policies and making decisions relating to heritage assets by seeking the reuse and, where appropriate, the modification of heritage assets so as to reduce carbon emissions and secure sustainable development. Opportunities to adapt heritage assets include enhancing energy efficiency, improving resilience to the effects of a changing climate, allowing greater use of renewable energy and allowing for the sustainable use of water." The benefits of the proposal in terms of the amount of clean energy produced and the amount of carbon emissions saved are sufficient to override any perceived harm associated with this proposal.

PPS5 further states that "where conflict between climate change objectives and the conservation of heritage assets is unavoidable, the public benefit of mitigating the effects of climate change should be weighed against the harm to the significance of heritage assets in accordance with the development management principles in this PPS and national planning policy on climate change."

The selection of the site has been guided by the need to meet the manufacturers' requirements for available wind, avoidance of turbulence and avoidance of exposure to noise. The appraisal indicated that the site is appropriate for the siting of two small scale wind turbines by virtue of its topography, wind characteristics and the technical performance of the proposed turbines. The development will generate electricity for the applicants' property where they are committed to reducing their fuel costs as well as their environmental and carbon footprints; and this application is an essential element in achieving this ambition. Furthermore, the proposal is for a temporary installation which if properly conditioned can be removed and the land left in a fully reinstated at the end of the turbines' useful life, therefore any perceived impact on the setting of historic features is only temporary in nature.

The map below in figure 21 shows that there are no registered Scheduled Monuments, Registered Parks and Gardens, World Heritage Sites, or Registered Battlefields in the vicinity of the site which would be affected by the proposal.

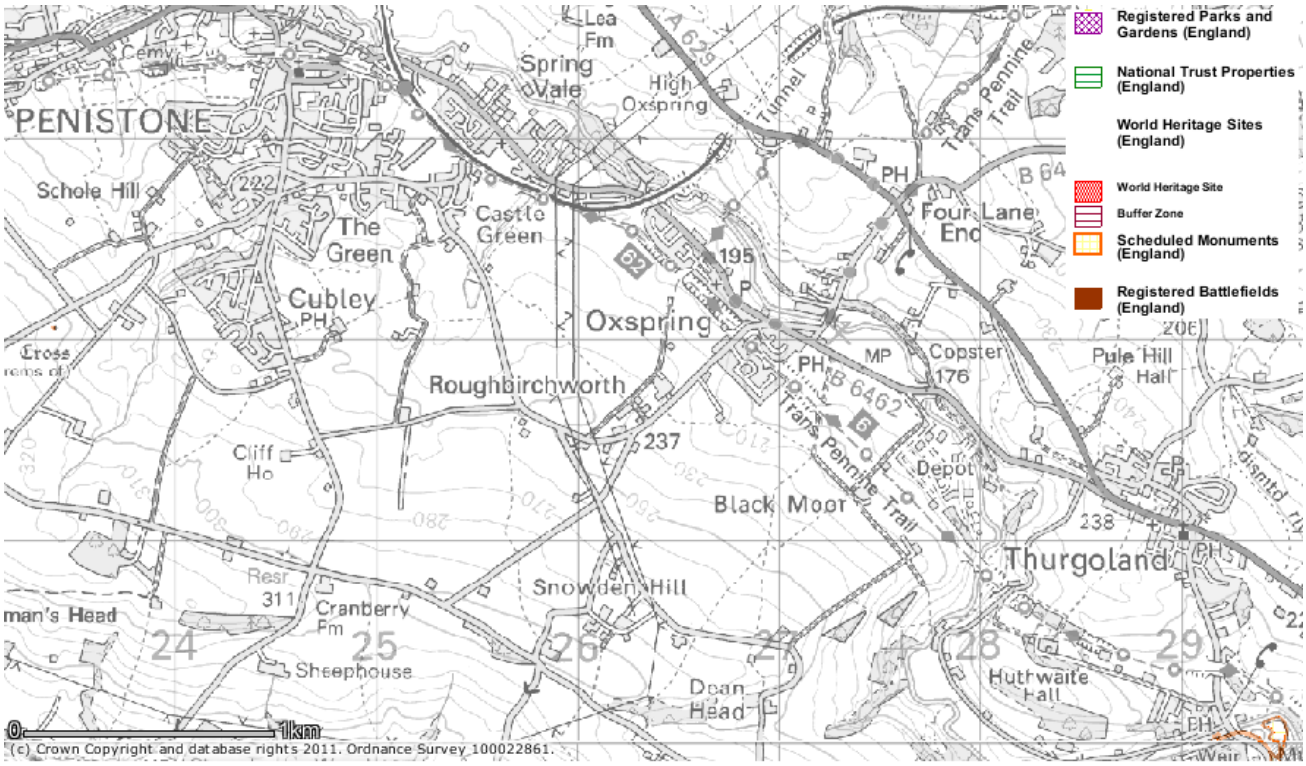


Figure 21: Map showing historic assets around the proposed site (Magic Map, Accessed 2011)

The installations will have limited material impact on the ground. The proposal consists of a two 11kW Gaia turbines, mounted on 18m masts, each on a 5m² concrete base. The bottom of each tower will be bolted onto a reinforced concrete base with dimensions 5 x 5 x 0.4m. This is set in a hole 1m deep with an 0.6m layer of hard packed earth on top. The turbines will be connected to the farm power supply at the main fuse box via an armoured cable buried at a depth of only 0.75m. With such a small scale of development and little impact underneath the ground with a maximum depth buried of 1 metre, it is considered that the proposed turbines will not have any impact on archaeological remains.

16. Installation and Access

16.1 Installation

The installation of the turbines will be completed in two stages. The foundations will take half a day to complete and must then be left for around three weeks to set. The erection of the turbines will take a further day. Excavations for the foundation and cable trenches will be carried out by a small, tracked mini-digger and surplus soil will be removed. All excavations, protection, cable laying, builders' works, holes through existing walls, etc., will be carried out in accordance with relevant health and safety requirements and good construction practice and the safe use of tools

and equipment. Care will be taken to ensure that tree roots are not interfered with. If roots are encountered then hand dig techniques will be used to ensure they are not damaged and that the viability of the hedgerow and trees are protected.

Gaia and the electrical component suppliers provide detailed instructions for the safe sequencing and carrying out of the installation and commissioning works. These will be followed in detail and include the fixing of notices etc. to the completed work for its continued safe use. Prior approval will be obtained from the existing energy supplier to make the final grid connections. During the course of the works protection to excavations, working areas etc. will be provided in accordance with good construction practice. Once the work is complete no special protection to the installation is required.

16.2 Access

Access to the site will be gained via the existing road network and site accesses. The components will be moved into position by mini-digger. It is likely that works to install the turbines will be carried out in the summer months when the land is sufficiently firm to transport the turbines to the site without the need to create any temporary access tracks. Excavations for the foundation and cable trenches will be carried out by mini-digger. All excavations, protection, cable laying, builders work, holes through existing walls etc. will be carried out in accordance with relevant health and safety requirements.

17. Health and Safety

The site is located within a field and the turbines are sited at least fall over plus 10% from any buildings or public rights of way as suggested in PPS22, therefore no issues with safety have been identified. Training for the safe use of the equipment will be provided to the end use. All the components are designed for a trouble free long life with minimum maintenance. An annual inspection of the turbine head is required to comply with the warranty requirements and to ensure efficient operation.

Indeed the Technical Annex for PPS22 states that experience indicates that properly designed and maintained wind generators are a safe technology.

18. Driver Distraction

Drivers are faced with a number of varied and competing distractions during a normal journey, including advertising hoardings which are deliberately designed to attract attention. At all times drivers are required to take reasonable care to ensure both their own and other's safety. The companion guide for PPS22 states that wind turbines should not be treated any differently from other distractions a driver must face and should not be considered particularly hazardous.

In this case due to the location, scale and siting of the turbines driver distraction is not considered to be a material consideration.

19. Decommissioning

The design of each wind turbine and the choice of location have been consciously made to facilitate ease of dismantling of the equipment and restoration of the site at the end of its useful life around 25 years. Annual maintenance will be required; measures will be taken to ensure this is carried out in accordance with health and safety requirements and to protect the safety and security of the public.

Neither the applicant nor Myriad CEG have objection to the imposition of a planning condition requiring removal of the turbines at the end of their operational life and reinstatement of the land to its former condition.

20. Conclusion

The site for the proposed wind turbines has been chosen carefully to ensure that it can be absorbed by the local landscape and is inconspicuous in the landscape from most mid and distant view points. The turbines have been sited to minimise the impact on this rural location, whilst optimising the potential energy production of the installation. Where distinguishable from close vantage points, from the road and from other public rights of way, the design, scale, form and appearance has been selected to ensure that the construction and operation on the proposed site will not be intrusive on the landscape, and are far outweighed by the economic, social and environmental benefits of the proposal outlined above.

The turbines have been sited a significant distance from residential properties to ensure that there are no issues associated with noise, shadow flicker or safety. Although the turbines will be visible from nearby roads and some points along nearby public footpaths, this does not render the scheme demonstrably harmful.

This proposal should be viewed as a piece of modern farming technology in a largely agricultural area that will, in the long term, help to maintain the viability of the landscape by reducing carbon emissions. Taken along with the demonstration of no harm and the very special circumstances in the accompanying Green Belt justification, it is considered that this development is appropriate for the location and purpose for which it is intended.