



Supporting Statement

Upper Maythorne Lane

20/03/2017



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Neo Environmental Ltd	
Scottish Office (Head Office) Wright Business Centre. 1 Lonmay Road. Glasgow. G33 4EL T 0141 773 6262 E: info@neo-environmental.co.uk	English Office: Valiant Suites. Lumonics House, Valley Drive, Swift Valley, Rugby, Warwickshire, CV21 1TQ T: 01788 297012 E: info@neo-environmental.co.uk
ROI Office: Johnstown Business Centre, Johnstown House, Naas, Co. Kildare, T: 00 353 (0)45 844250 E: info@neo-environmental.ie	NI Office: Premier Business Centre 20 Adelaide St, Belfast, Northern Ireland BT2 8GD T: 02890 517 092 E: info@neo-environmental.co.uk



Prepared For:

Ged Parker



Prepared By:

Michael McGhee BSc TechIOA
Dawn Thompson BSc (Hons) MCIEEM AEECW
Michael Briggs BSc (Hons) MSc ACIfA
Ronan Finnegan BSc PGDip LA
Jodie Kane



	Name	Date
Edited By:	Susan Bell	20/03/2017
Checked By:	Michael McGhee	20/03/2017
	Name	Signature
Approved By	Paul Neary	

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1. INTRODUCTION

DEVELOPMENT DESCRIPTION

- 1.1. Neo Environmental Ltd has been appointed by Mr Ged Parker ("the Applicant") to prepare a Supporting Statement for the relocation and erection of one Bergey 10kW wind turbine at Upper Maythone Lane, Holmfirth, HD9 7TF (see **Figure 2.2** for location). The turbine itself measures 15m to hub and 18.495m to blade tip and is being relocated to NGR E418809 N405838.
- 1.2. The Supporting Statement is being submitted in support of the Planning Application to Barnsley Metropolitan Borough Council (hereinafter referred to as "Barnsley Council") for the proposed wind energy development.

SITE DESCRIPTION

- 1.3. The area of the proposed Development (the "Application Site") comprises the western boundary of a large agricultural field, c. 350m by 250m in size. The land within the field is relatively flat with a gentle slope from south-southwest to north-northeast and an elevation of c. 348 – 331m AOD. The land is largely bound by low-lying hedgerows, post-and-wire fencing and a drystone wall along the western boundary which is adjacent to the proposed turbine location.

SCOPE OF REPORT

- 1.4. This Supporting Statement outlines the rationale for the proposed development and includes an assessment of environmental, landscape, ecological and technical impacts the proposed development may have. Mitigation measures have been proposed to address these impacts where appropriate. This has helped define the scope of the proposal and all these factors have been taken into account when siting the turbine and refining the scheme.
- 1.5. This statement has been compiled in compliance with the various relevant statutory guidelines and policies set out by Barnsley Council and contains all information detailed within the email request from Planning Officer Matthew Smith (hereinafter referred to as the "Planning Officer") on the 28th April 2016.

2. DEVELOPMENT PROPOSAL & SITE SELECTION

SITE SELECTION

- 2.1. In this instance, the turbine is being relocated from its consented site to a new location further north. The Applicant has considered a number of requirements when selecting the optimum site for the proposed development. From an operational perspective, the proposed development site provides an excellent opportunity for wind energy development due to a number of site specific elements, including: a good wind resource, access and limited environmental constraints.

SITE LAYOUT

- 2.2. As shown in **Figure 2.1**, the proposed development covers an area of 0.0812 hectares (314m²) and will comprise of the following components:
- One Bergey 10kW wind turbine;
 - Turbine foundations; and
 - Cable Route.

Wind Turbine

- 2.3. The wind turbine selected for the proposed development is the Bergey 10kW machine, the specifications of which are outlined below:
- Number of Turbines: 1
 - Number of blades: 3
 - Height to Hub: 15m
 - Rotor Diameter: 6.99m
 - Blade Tip Height: 18.495m
 - Total Output: 10kW

CONSTRUCTION

- 2.4. Construction of the turbine is expected to occur over a broken 4 week period. The initial groundworks and foundation construction will be completed in 1-2 days, with a 2-3 week cessation of works whilst the concrete foundations cure. A final site visit will be undertaken for tower construction and commissioning, which should take circa 1-2 days.

TRAFFIC AND TRANSPORT

- 2.5. The transportation of Bergey wind turbines will require standard trucks, which are within normal and acceptable public highway vehicle size. As the local area is rural and supports an agricultural economy, vehicles of this size are routine on the local highways.
- 2.6. Once the turbine has been constructed, traffic to the site will be limited and will only be required for maintenance purposes every year.

DECOMMISSIONING

- 2.7. The standard expected operational period for wind turbines is 25 years; at the end of this period the project will be decommissioned. As part of this process the wind turbine will be disconnected and the various components removed from site. If an extension of the operational period is sought it must be carried out in accordance with relevant planning legislation and regulations.
- 2.8. In the case where the turbines are decommissioned, the site will be reinstated as closely as practicable to its original condition within 6 months. This will involve above ground components being dismantled and removed from the site (these parts are commonly recycled). Cabling will be removed from the ground and recycled, leaving only the ducting in-situ. Turbine foundations will be removed completely.
- 2.9. The ease and rate at which wind turbines can be decommissioned allows for site restoration leaving no visible trace of the development's existence. The logistical impacts of decommissioning are expected to be similar in timescale and load to the construction phase.

DEVELOPMENT JUSTIFICATION

Background

- 2.10. The Development proposal relates to the relocation of a consented turbine, granted permission under LPA Ref: 2010/1468, to a position within the same field but approximately 150m north-northeast.
- Current: E418736, N405694
 - Proposed: E418809, N405838
- 2.11. The subject site is not located within any national or regional land designation. However, it is located in an area designated as Green Belt by Barnsley Council. This statement provides justification for the development in this context confirming that the resulting impact of the proposal upon the Green Belt will be insignificant and that 'Very Special Circumstances' exist to allow the development to proceed.

Policy Context

- 2.12. On a national level the National Planning Policy Framework (NPPF) 2012 provides specific guidance on protecting Green Belt land and reiterating that the fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open. The framework also states that the essential characteristics of Green Belts are their openness and their permanence.¹
- 2.13. The NPPF outlines that Green Belts must serve five main purposes², namely:
- *"to check the unrestricted sprawl of large built-up areas;*
 - *to prevent neighbouring towns merging into one another;*
 - *to assist in safeguarding the countryside from encroachment;*
 - *to preserve the setting and special character of historic towns; and*
 - *to assist in urban regeneration, by encouraging the recycling of derelict and other urban land."*

¹ NPPF (2012) Paragraph 79

² NPPF (2012) Paragraph 80

2.14. The NPPF also states that:

*"As with previous Green Belt policy, inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances."*³

2.15. At local level, a new BMBC Local Plan is anticipated to be adopted in the summer 2017. This document is with the Secretary of State for Communities and Local Government and once adopted this will replace the Statutory Development plan which comprises a number of documents including the Barnsley Local Development Framework Core Strategy (CS). Sept 2011. These documents provide the primary policy test at present. The CS is in favour of the development of renewable energy and confirms the following in relation to protection of the Green Belt:

*"There is a need to strengthen the rural economy through appropriate diversification without compromising the Green Belt and the historic and natural environment."*⁴

2.16. Specific policy is provided for the protection of Green Belts within the CS via CSP 34 which states:

*"In order to protect the countryside and open land around built up areas the extent of the Green Belt will be safeguarded and remain unchanged."*⁵

2.17. The Local Plan advocates the same principles as the NPPF. In addition to this, Policy CSP 34 – Development that Produces Renewable Energy, confirms that development will also be supported where visual and amenity impact is considered to be acceptable.

Local Green Belt Setting

2.18. Both the existing and proposed site are contained within the northern Green Belt designation that exists around Crow Edge. See Fig. 1 above. The Council produced the "Barnsley Green Belt Review" in August 2014 with the evaluation of the 'Rural Western Villages', specifically concluding that the Crow Edge Green Belt (CE1) is not strongly fulfilling the purposes of the Green Belt. However, it did recognise that:

"...on the whole the northern boundary of the Green belt does strongly assist in safeguarding the countryside from encroachment."

Very Special Circumstance

2.19. As outlined above, the main purpose of a Green Belt designation is to maintain openness and to safeguard the countryside from encroachment. Renewable energy development is listed as an inappropriate element unless it can both maintain openness of the countryside and

³ NPPF (2012) Paragraph 87

⁴ BMBC CS (2011) Paragraph 4.20

⁵ BMBC CS (2011) Policy (CSP) 34 - Protection of Green Belt



offer Very Special Circumstances to merit approval. Such circumstances may include the wider environmental benefits associated with the increased production of green energy from a renewable source and one must give due regard to the fact that the Government has set very challenging targets for climate change. There is currently a gap between the provision of existing infrastructure and these targets especially within the North England and current policy attaches significant weight to the need to tackle climate change and promotes the role that renewable energy technologies can play in this.

2.20. In securing the original consent, the principle of Very Special Circumstance was established and when put into operation the benefits claimed at an application stage came to fruition, namely:

- The supply of clean energy negating the need for reliance on unsustainable power sources; and
- A reduction of carbon emissions.

Indeed, the power generated from the turbine is utilised in the landowners' residential properties making them almost self-sufficient in electricity and provide a large base load contribution to the heating requirements over the year. The turbine currently brings direct benefits to the landowner producing approximately 21000 kWh of clean electricity per year, equating to a reduction in 11.36 tonnes of CO² per annum.

2.21. Had this Very Special Circumstance not become so important to the landowner they would not be going to such efforts to ensure the retention of the turbine on their land.

Conclusion

2.22. In this instance, the turbine is being relocated from its consented site to a new location further north. In considering this proposal the Council must satisfy itself that the relocation does not result in any increased impact upon or harm to the Green Belt. Both the established and proposed sites have the turbine and associated development occupying land that had not previously been built upon and both sites could therefore be considered to interrupt natural landscape. However, the principle of development has been established and in granting consent for the initial development the Council have agreed that open countryside is a reasonable location for wind turbine development, with access to uninterrupted wind resource being a direct operational requirement. They have also reached the reasonable conclusion that the limited footprint of the proposed small scale turbine development means that the extent of any encroachment upon the countryside would be minimal.

2.23. Indeed, whilst a degree of encroachment will again occur, this will not be made any worse by the newly proposed location. Similarly, the degree of vertical disruption and the limiting effect upon openness by way of the swept path of the blades will not be to any greater detriment

than that which has already been considered reasonable and acceptable. It could also be argued that the new location and its lower topography and further removal from nearby public and private viewpoints will actually help to further mitigate impact. As one will appreciate, the consented site was identified as a preferred alternative option following the withdrawal of a preceding application under LPA Ref: 2010/1190. The newly proposed site will see the turbine's prominence in the landscape reduce even further.

2.24. To conclude, we would reiterate the following:

- The principle of the development has long been established;
- Very Special Circumstance has been established;
- No greater harm to the Green Belt will occur;
- The development will not prevent the Green Belt from fulfilling its five key objectives;
- Impact upon general amenity will be reduced;
- The financial and sustainability benefits supplied by a turbine development at the host property have been established; and
- The turbine makes a valuable localised contribution to National targets.

2.25. On this basis, there is clear justification for the support of this proposal with regard to policies protecting Green Belt land.

3. LANDSCAPE & VISUAL APPRIASAL

INTRODUCTION

- 3.1. This Landscape and Visual Appraisal will consider how the proposed turbine will influence the underlying landscape and visual baseline in comparison to the existing Upper Maythorne Lane turbine which it is intended to replace.
- 3.2. The proposed turbine will also be a similar micro-scale turbine and its overall height of 18.495m will be 1.255 less than the existing turbine. It will be located at an elevation approximately 8m lower and 160m further to the northeast than the existing turbine, whilst still contained within the same field.
- 3.3. A desk based assessment and field photography have been undertaken to determine the potential impact of the proposed Development upon the landscape resources, views and visual amenity. An initial study area of 15km was considered for the baseline data collection in keeping with guidance provided by SNH on Small Scale Wind⁶. This study zone was reduced to 5km as it is considered that any perceptible potential impacts will be localised due to the relative small scale of the proposed development and landscape setting.

LANDSCAPE APPRAISAL

Regional and Local Landscape Character Studies

- 3.4. A landscape character assessment was initially undertaken by Barnsley Council in 2002 and later reviewed in 2016⁷ to determine any notable changes to the landscape. The Application Site falls within the Landscape Character Type (LCT) F: Upland Farmland and F1: Ingbirchworth Upland Farmland Landscape Character Area (LCA). The LCT is defined by its undulating and stepped landforms above 200m. The rural landscape of predominantly improved pasture with some unimproved areas on steeper or more elevated slopes. The griststone walls provide a geometric pattern over the hills. The field sizes vary from small to large field systems, with the smaller fields in sheltered areas and larger field over the higher moors. The area has a sense of remoteness and settlement pattern is one of scattered hamlets and agricultural settlements.

⁶ Scottish Natural Heritage (March 2016) *Assessing the impact of small scale wind energy proposals on the natural heritage Guidance*. Available at: <http://www.snh.gov.uk/docs/A1323094.pdf>

⁷ Barnsley Metropolitan Borough Council (2016) *Barnsley Borough Landscape Character Assessment – 2016 Review*. Available at: <https://www.barnsley.gov.uk/media/4582/eb87-barnsley-landscape-character-assessment-2016-update.pdf>

- 3.5. The Council's 2016 review found that much of the condition of the underlying landscape remains the same as of the 2002 study, but these lands have since been influenced by various wind energy developments.
- 3.6. *"Cumulatively the turbines have detrimentally impacted upon strength of landscape character but it is considered to remain strong. The area still remains rural in character and its low density settlement pattern and distinctive field patterns make the landscape sensitive to built development and so landscape sensitivity remains high and capacity is considered low."*
- 3.7. The South Pennines Wind Energy Landscape Study (SPWELS) has assigned different Landscape Character Types and Landscape Character Areas across its study area. The Application Site falls within the LCT D: Moorland Fringes/Upland Pastures and LCA D9: Low Common, Royd & Whitley Common. The D9 LCA corresponds with the LCA F1: Ingbirchworth Upland Farmland (east part) from the earlier Barnsley Borough Council 2002 study.
- 3.8. The characteristics of the LCA D9: Low Common, Royd Moor & Whitley Common are described as:

"This is an expansive moorland fringe area above Hepworth and Denby Dale which extends southwards beyond Kirklees District into Barnsley Borough. The area includes improved moorland used for grazing with a visually strong and intact pattern of medium to large scale stone wall enclosures. It differs from other moorland fringe landscapes to the west in that it does not form an immediate foreground to the higher moorland plateaux of the Dark Peak, which lie further away to the southwest. Nevertheless it sits above adjacent valleys forming distinct stepped ridges in the west and lends an important backdrop to settlement. Away from the edges this landscape is open and simple and contains wind farm development, masts and reservoirs."

Local Landscape Character

- 3.9. The key characteristics of the Application Site and surrounding land resonate those found across the above LCT/LCA defined within the Council's and SWEA studies. The Application Site is within Upper Maythorne Farm, upon a large field of improved grassland bound by low whinstone walls. The surroundings lands consist of similar improved grassland divided over a number of farms which contain a mix of modern large agricultural sheds. There are some older sandstone dwellings found within these farm or as individual dwellings. Across these relatively open lands are number of single wind turbines located within the neighbouring farms and also windfarms located by Whitley Common and Spicer Hill. Their slender form make them distinct vertical features set against the skyline.

South Pennines Wind Energy Landscape Study Version 2

3.10. The South Pennines Wind Energy Landscape Study ("SPWELS")⁸ was prepared by Julie Martin Associates and LUC on behalf of five councils across the South Pennines (Burnley, Calderdale, Kirklees, Rossendale and Barnsley) to help identify the strategic landscape sensitivity of the LCTs to different scales of wind turbine developments and cumulative impacts. It provides an update to the previous version published in 2010 in which this landscape has since experienced a notable increase of wind turbine developments.

3.11. The study defines the proposed Development's typology height as a very small turbine ($\leq 24\text{m}$ to blade tip) and its grouping class as a single turbine.

3.12. The study identifies the Moorland Fringes/Upland Pastures LCT as having an overall Medium Landscape Character Sensitivity to very small turbine scales with increasing sensitivity to all higher scales of turbines, although it states there are some locally lower sensitivities across the likes of the LCA 9 and LCA10:

"where the landscape is somewhat larger in scale (more expansive, with larger enclosures) than elsewhere or is already affected by influences such as quarrying e.g. south of Lane Head close to the boundary between Kirklees and Barnsley (LCAs D9 and D10)."

3.13. The SPWELS guidance for wind energy within the Moorland Fringes/Upland Pastures LCT states:

"This LCT is highly sensitive to larger scale wind energy development. In general it is suited only to scattered 'very small' (or occasionally small) single turbines that will relate well to the many human scale features that characterise its landscape. Only in exceptional cases may this LCT be able to accommodate larger turbines or groups of turbines."

3.14. The guidance on opportunities for wind within this LCT include:

"Small scale wind energy development that is visually associated with settlements or farms, and evenly spread across the landscape rather than concentrated in one particular area, will be most suited to this landscape."

Locally, where the landscape is somewhat larger in scale (more expansive, with larger enclosures and sparser settlement) there may very occasionally be scope for small turbine groups or single larger turbines, subject to consideration of cumulative impacts. This applies in D9 and D10 only."

3.15. In relation to cumulative landscape and visual issues arising it states:

"Siting of small turbine classes very close to larger turbines, notably in D4 near Bacup, D1 on the boundary of Burnley and Calderdale, and D9 on the boundary of Kirklees and Barnsley."

⁸ Julie Martin Associates and LUC (2014) South Pennines Wind Energy Landscape Study. Available at: <http://lucmaps.co.uk/SPWED/mainmenu.html>

Here the juxtaposition of turbines of different heights and designs may be distracting and/or tends to heighten the perceived scale of the larger turbines.

Concentrations of smaller turbines, notably in D1 near Todmorden, D2 west of Ripponden, D7 south of the M62 and near Holmfirth, and D9 on the boundary of Kirklees and Barnsley. In these areas turbines are collectively becoming a defining influence on the landscape and there are frequent variations in turbine height and design."

- 3.16. Where cumulative issues may constrain future development the siting of any turbine within a landscape containing multiple wind energy developments should:

"Be similar in terms of siting, layout, form and relationship to key landscape characteristics, so as to present a simple image that relates clearly to landscape character – for example through a clear association of 'very small' turbines with the regular clusters of farm buildings that occur in this LCT.

When locating 'very small' and 'small' turbines, choose sites that are well away from medium or large turbines (in the same or adjoining LCTs), so that the different size classes are not seen together, and avoid strong concentrations of turbines in a given area.

Also avoid close juxtaposition of different small turbine designs and heights, aiming instead for a consistent height and design in a given area."

Landscape Designations

Peak District National Park

- 3.17. The Application Site at its nearest is located approximately 3km north of the Peak District National Park, by the intersection of the Trans Pennine Trail and the A616 Whams Road off Thurlstone Moor. The small proportion of the National Park within the study zone extends to lands just south of the A628 by Thurlstone Moor and towards Winscar Reservoir to the southwest.
- 3.18. A number of turbine developments of various scales, including Hazelhead windfarm, are found within the intervening rural landscape between the National Park boundary and the Application Site.

Public Rights of Way (PROW) & Routes

- 3.19. There are many publicly accessible paths and cycling route within the 5km study zone. These routes provide recreational opportunities for local residents and visitors to access paths through the rural landscape and the Peak District National Park. The nearest PROW is on Calf Hey Lane which lies approximately 327m southeast of the proposed development. Other nearby routes include the Barnsley Boundary Walk Long Distance Trail on Birdsnest Lane and the National Cycle Route No. 627 on Broadstone Road, located approximately 0.826km and 1.35km to the northeast respectively, both near to Broadstone Reservoir.



3.20. A number of turbines of various scales are clearly visible from these routes due to the relatively open landscape.

VISUAL APPRAISAL

Visual Receptors and ZTV

- 3.21. The narrow vertical form and moving blades of the turbine will mean they may be potentially visible from receptors including: residents, recreational users, road users or workers within the surrounding landscape.
- 3.22. A Zone of Theoretical Visibility (ZTV) was produced to show both the potential visibility of the proposed Development and the existing turbine within the local area, out to 5km, see **Figure 3.1**. The ZTV helps to show variations in the potential visibility of both turbines due to their differences in scale and elevation. The ZTV is based on 50m Digital Terrain Model (DTM) data derived from Ordnance Survey Terrain 50 Data. It provides a ‘worst case scenario’ as it does not account for any intervening vegetation or buildings which may otherwise provide some degree of screening. It is a useful tool in understanding where the proposed development may be potentially visible and in the selection of viewpoints for analysis.
- 3.23. The two representative viewpoints from nearby receptors were selected and submitted for review by Barnsley Council. These viewpoints were approved by the Planning Officer on the 8th of March 2017 and are listed in **Table 3.1** below.

Table 3-1: Upper Maythorne Lane Selected Viewpoints

Viewpoint Number	Location	Distance and Direction from nearest turbine	Receptor	Reason for choosing
Viewpoint 1	Brown’s Edge Road 419133 E 405671N	364m Southeast	Road Users	Passing wide open views on minor road
Viewpoint 2	On Grime Lane approx. 121m northwest of Maythorne 418489 405954N	245m West southwest	Residents and Road Users	Nearby residence and passing views along minor road

Visualisations

- 3.24. The viewpoint photography was used to produce two photomontages (Figure 3.3a/b and 3.4a/b) to help illustrate how the proposed wind turbine would appear within the local landscape. The photography was undertaken on the 16th of March 2017 with a Canon 5D II full frame camera and fixed 50mm lens in keeping with best practice SNH visualisation guidance for wind energy development⁹. The photomontages have been taken at 50mm and recalibrated to 75mm. They should be printed onto A3 size paper and read flat at a comfortable arm's length. The existing turbine at Upper Maythorne Farm has been excluded from these photomontage images as it will be taken down prior to the installation of the proposed replacement turbine.

Viewpoint 1: Brown's Edge Road

- 3.25. Travelling along this road in both directions there are a number of wind turbines varying in scale from very scale farm/domestic turbines to large wind farms visible within relatively close proximity and mid to distant views.
- 3.26. The existing turbine would be removed from this view and will be replaced with a similar form of turbine but set at a slightly lower elevation within the field. This change in location would result in the new turbine being viewed slightly closer and within a different direction of view with the larger existing Martins Nest Farm turbine (34.2m to tip). Overall there will be little change to the transient views already experienced from this point when comparing the visual setting of the existing and proposed replacement turbine.
- 3.27. Potential cumulative views from this point will include the Development viewed in combination with the Martins Nest Farm turbine (34.2m to tip). Successive views will occur with several other turbines located within the farms to the west, along the slopes of Anchor Hill (18m to 36.55 to tip), then the turbine to the south at Brown Reservoir (34.2m) and then to the southeast of the wind farms of Blackstone Edge and Spices Hill (95m to 101m blade tip). Such static views will be experienced temporarily by anyone who stop on this route, with most views being experienced as passing sequential views along this road. There will be little difference to the cumulative views already experienced with the existing turbine and that of the proposed replacement turbine due to their setting and scale.

Viewpoint 2: On Grime Lane approx. 121m northwest of Maythorne

- 3.28. This view is taken just up the road from the residential property of Maythorne as it allows clearer views across the farmland than experienced at this residence. Views from the residence are blocked by the sheds and roadside scrub. Views are looking across to the various farm buildings within Upper Maythorne Farm. Behind the farm buildings this farm's existing

⁹ Adapted from guidance from SNH Visualisation Representation of Wind Farms (Version 3, February 2017)



turbine is visible in combination with the much larger windfarms at Blackstone Edge, Spices Hill and also Royd Moor (54.5m to blade tip).

- 3.29. The proposed turbine will be clearly visible in the middle ground and back dropped by the turbines within the Blackstone Edge wind farm (0.8km to 1.23km), Spices Hill (2.23km to 2.54km to the southeast) and to a lesser extent Royd Moor (2.43km to 3.2km), all located to the southeast.
- 3.30. While the siting will create some visual discrepancy between the developments due to their differences in scales and rotational speed, the view from this point will be limited to passing road users. There will be some similar views from the grounds of the residence at Martins Nest Cottage, though this receptor is located approximately 190m further to the northwest of this point and 480m from the turbine. The distance will help further reduce any visual distraction between the proposed very small scale turbine and the large windfarms.

Cumulative

- 3.31. The South Pennines Wind Energy Database provides a database of all turbines of 18m or higher found within the five council areas which include operational, approved not constructed or pending decision. These have been mapped out to within 5km of the proposed Upper Maythorne Lane turbine in **Figure 3.2** and listed in **Appendix C**. Where there is more than one turbine within a development they are mapped as a single central dot.
- 3.32. The landscape already contains several clusters and individual turbines within the Moorland Fringes/Upland Pastures LCT and to a lesser extent the Upper River Valley, Rural Fringe and Wooded Rural Valleys LCTs. The majority of these turbines are to be found within the Low Common, Royd Moor & Whitley Common LCA. Most turbines are of very small to small height scale and associated with farms found to the northwest through to the northeast of the proposed Upper Maythorne Lane Turbine. There are a number of larger windfarms including Blackstone Edge, Spicer Hill and Royd Moor to the southeast and Hazlehead Wind Farm further the south of the proposed Upper Maythorne Lane turbine. A number of pending applications are for medium scale single turbines.
- 3.33. The replacement of the existing Upper Maythorne Lane turbine with a turbine of the same very small height scale and located within the same field would have no notable change upon the landscape character of the Low Common, Royd Moor & Whitley Common LCA nor upon the wider Moorland Fringes/Upland Pastures LCT.
- 3.34. The potential cumulative views of the Development with other turbines has been previously considered from the two viewpoint locations. The repositioning of the proposed turbine inwards into the field will slightly make it more visible with other developments from views looking across to the east and west, as it is not partially screened by any farm sheds as shown in Viewpoint 2. Yet the undulating landform and very small scale of the proposed turbine helps to limit the extent of these potential cumulative views with other developments to the immediate local roads and nearest residential receptors.

- 3.35. Many receptors will experience views of the proposed Upper Maythorne Lane with these operational turbines either in combination, successively (turning around) or sequentially from the two viewpoints and local landscape. The setting, distance and scale of the proposed turbine will ensure that it is clearly viewed as a separate wind energy development to the operational turbines found across the local landscape. There will be some visual discrepancies due to the smaller rotator span and faster rotational speeds in comparison to the larger operational turbines.

Conclusion

- 3.36. The Development will seek to replace an existing very scale turbine sited on farmland within the F1: Ingbirchworth Upland Farmland and D9: Low Common, Royd Moor & Whitley Common LCAs. It will be set further within the field by approximately 160m north and be approximately 1.255m lower in height 8m lower in elevation than the current turbine. The addition of the proposed replacement turbine to this landscape will not have any notable change to the existing characteristics of the Application Site or surroundings as there is already a similar scale of wind turbine present on this land. Overall, the replacement of the existing turbine with a similar proposed turbine will not adversely affect the underlying landscape character.
- 3.37. The scale of the Development is classed as a very small turbine within the SPWEL study. The study specifies that the Moorland Fringes/Upland Pastures LCT has an ability to accommodate very small scale turbines where they relate well to human scale and visually associated with farm buildings. It also specifies that the siting of very small scale turbines should be suitably distance away from medium and large scale turbine to ensure there is no conflict between the different scales.
- 3.38. Visually the lower setting and scale of the turbine will help to very slightly reduce its visibility across the wider study zone in comparison to the existing turbine at Upper Maythorne Lane, as shown by the ZTV (Figure 3.1). There will be some visual discrepancies where the setting of the new turbine further north in the open field allows it be to more cumulatively visible with other turbines in the area, than the existing turbine. However, the distance from these other turbines and the receptors will help limit any notable cumulative visual effects to the immediate local area. The greatest views will be looking towards the east and west, with most experienced sequentially passing along local roads and some limited static combined or successive (turning around) views from residents.
- 3.39. The scale of the Development is classed as a very small turbine within the SPWEL study. The study specifies that the Moorland Fringes/Upland Pastures LCT has an ability to accommodate very small scale turbines where they relate well to human scale and are visually associated with farm buildings. It also specifies that the siting of very small scale turbines should be suitably distanced away from medium and large scale turbine to ensure there is no conflict between the different scales. The suitable positioning of the proposed turbine within the landowners land is limited by necessary noise buffers. The proposed position will have some very limited localised visual discrepancy between the smaller wind turbine and larger

windfarms when looking towards the east to south-easterly direction. This will only affect a small number of receptors.

4. ECOLOGY

INTRODUCTION

- 4.1. A desk-based Ecological Appraisal has been undertaken with the objective of identifying and describing any likely significant effects on ecology arising from the proposed Development.
- 4.2. In order to assess the potential ecological impacts of the proposed Development during the construction, operation and decommissioning phases, this chapter identifies the current ecological condition of the Development site and the surrounding area. This allows for the identification of potential ecological impacts and the compilation of mitigation measures where appropriate
- 4.3. The proposed development will consist of the relocation of one small-scale wind turbine, 18.495m to blade tip, to a point north of its existing location.

LEGISLATION AND PLANNING POLICY CONTEXT

EUROPEAN LEGISLATION

EU Habitats Directive 92/43/EEC

- 4.4. The EU Habitats Directive sets out the framework for the designation and protection of sites for nature conservation for species and habitats listed in Annex II, IV and V.
- 4.5. *"The main aim of the Habitats Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance"*
- 4.6. The protection of species outlined in the Habitats Directive is transposed into national legislation principally by 'The Conservation (Natural Habitats &c.) Regulations 1994¹⁰, as amended by the Conservation (Natural Habitats &c.) (Amendment) Regulations 2007 and 2009 respectively'

¹⁰ Parliament of the United Kingdom, 1994. The Conservation (Natural Habitats, &c.) Regulations 1994. Available at <http://www.legislation.gov.uk/ukSI/1994/2716/contents/made>

EU Birds Directive EC/79/409

- 4.7. The Birds Directive sets out the criteria for Special Protection Areas including; a list of species requiring protection in Annex 1 of the Directive and mechanisms for protecting wild birds naturally occurring in Europe. This Directive is transposed into national legislation principally by the 'Conservation (Natural Habitats, &c.) Regulations 2010¹¹ (as amended)'.
- 4.8. The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each Member State.

Environmental Liability Directive 2004/35/EC

- 4.9. The [Environmental Liability Directive](#) aims to make those causing damage to the environment (water, land and nature) legally and financially responsible for that damage.
- 4.10. The directive covers environmental damage caused by or resulting from occupational activities to:
- 4.11. Species and natural habitats protected under the 1992 Habitats Directive and the 1979 Wild Birds Directive. Damage to protected species and natural habitats is *"any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species"*.

NATIONAL LEGISLATION

Habitats Regulations

- 4.12. The Conservation (Natural Habitats &c.) Regulations 1994, as amended by the Conservation (Natural Habitats &c.) (Amendment) Regulations 2007 and 2009 respectively, transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (Habitats Directive) into English law, making it an offence to deliberately capture, kill or disturb any wild animal protected under the Habitat Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time).

Wildlife & Countryside Act

- 4.13. The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act (CROW) 2000 and the Natural Environment and Rural Communities Act (NERC) 2006, consolidates and amends existing national legislation to implement the Convention on the

¹¹ Parliament of the United Kingdom, 2010, *The Conservation of Habitats and Species Regulations 2010*. Available at <http://www.legislation.gov.uk/uksi/2010/490/contents/made>

Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 of the Act, or its dependent young while it is nesting.
- Intentionally kill, injure or take any wild animal listed under Schedule 5 of the Act; intentionally damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 of the Act; disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection.
- Pick or uproot any wild plant listed under Schedule 8 of the Act.

Protection of Badgers Act

- 4.14. The Protection of Badgers Act 1992 makes it illegal to kill, injure or take a badger or to intentionally or recklessly interfere with a badger sett. Sett interference includes disturbing badgers whilst they are occupying a sett or obstructing access to it.

BIODIVERSITY ACTION PLANS

- 4.15. The UK Biodiversity Action Plan (UKBAP) (Anon, 1995) was organised to fulfil the Rio Convention on Biological Diversity in 1992, to which the UK is a signatory. A list of national priority species and habitats has been produced with all listed species/habitats having specific action plans, defining the measures required to ensure their conservation.
- 4.16. Regional and local BAPs have also been organised to develop plans for species/habitats of nature conservation importance at regional and local levels. The Barnsley Biodiversity Action Plan includes a number of Priority Species including bats, hedgehog, water vole, otter, lapwing and great crested newt.

METHODOLOGY

- 4.17. A desk-based assessment was undertaken to collate available ecological information for the site and the surrounding area. This included a search of statutory designated sites within a 10km radius of the proposed development, including: Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Areas of Conservation (SACs), National Nature Reserves (NNRs), RAMSAR Sites and Local Nature Reserves (LNRs). The descriptions of each

of these sites was obtained utilising the Natural England¹² and Joint Nature Conservation Committee¹³ (JNCC) websites.

- 4.18. A data search was commissioned the National Biodiversity Network (NBN) to obtain information regarding protected/notable species within 2km of the proposed wind turbine location. The proposed Development lies within the 10km grid reference SE10.

BASELINE CONDITIONS AND IMPACT ASSESSMENT

Designated Sites Baseline

- 4.19. The proposed wind development at Upper Maythorne Lane does not lie within or adjacent to any statutory or non-statutory designated environmental sites. Within 15km of the proposed development boundary there is one SSSI, one SPA and one SAC. Each of these sites are outlined in **Table 4-1** below. The site descriptions are derived from the original site citations available from NE and JNCC.
- 4.20. Please refer to **Figure 4.1** for a detailed map of the designations within 5km of the proposed Development.

Table 4-1: Designated Sites within 5km

Site Name	Notable Features	Distance (km)	Direction
The Dark Peak SSSI	- Blanket peat - Geology - Plateaux blanket mires - Wet and dry heaths - Acid grasslands - Associated flushes and mires on moorland slopes - Nationally important breeding populations of	4.2	SW

¹² Available at: <https://designatedsites.naturalengland.org.uk/>

¹³ Available at: <http://jncc.defra.gov.uk/>

	golden plover <i>Pluvialis apricaria</i> • Significant numbers of meadow pipit <i>Anthus pratensis</i> • Significant numbers of breeding curlew <i>Numenius arquata</i> • Red grouse <i>Lagopus lagopus</i> • Merlin (3.3% of the British population) • Short-eared owl <i>Asio flammeus</i> (1.1 % of the British population) • Twite <i>Carduelis flavirostris</i>.		
Peak District Moors (South Pennine Moors Phase 1) SPA	• Merlin <i>Falco columbarius</i>; (Breeding) • European golden plover <i>Pluvialis apricaria</i>; (Breeding) • Short-eared owl <i>Asio flammeus</i>; (Breeding)	4.2	SW
South Pennine Moors SAC	• European dry heaths • Blanket bogs • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	4.2	SW

	- Northern Atlantic wet heaths with <i>Erica tetralix</i> - Transition mires and quaking bogs		
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Designated Sites Impact Assessment

- 4.21. All three designated sites within 5km of the proposed Development share similar boundaries, and are located within approximately 4.2km of the Application boundary.
- 4.22. The notable features of these designated sites include habitats and avifauna. Given the separation distance between the proposed Development and the designated areas, it is considered that there will be no direct impacts due to habitat loss or disturbance.
- 4.23. There are no hydrological links between the designated sites and the proposed Development at Upper Maythorne Lane, and therefore no indirect impacts are predicted for these notable habitats at the Dark Peak SSSI / South Pennine Moors SAC.
- 4.24. Bird species are highly mobile, and therefore individuals associated with the designated sites are likely to forage and commute across the local landscape outwith the boundary of each designated site.
- 4.25. However, of the notable species only merlin have a core foraging area of equal to or greater than the separation distance between the sites and the proposed Development boundary. Core foraging area of merlin is generally within 5km of their nesting sites. Although the closest boundary of the designated land falls within 5km of the proposed development, the overall percentage of land is small, and the designate site covers a large expanse away from the Development at Upper Maythorne Lane. It is therefore considered that the connectivity between the designated areas and the proposed Development will be limited (if any) for merlin.
- 4.26. Given the lack of connectivity between the Dark Peak SSSI / South Pennine Moors SAC / Peak District Moors (South Pennine Moors Phase 1) SPA and the proposed Development, as well as the small scale of the proposed 10kW single turbine, it is considered that there will be no significant impacts upon the designation of these sites.

Protected/Notable Species Baseline

- 4.27. The potential presence of protected species within the study area was assessed though a data search conducted through the NBN. This identified records of invasive, rare, scarce and protected species within 2km of the proposed development location.

- 4.28. Table 4-2 below summarises the protected/notable species recorded within the search area, and their potential to be present within the proposed development at Upper Maythorne Lane.

Table 4-2: Summary of Biological Records – Grid reference SE10

Species	Number of Records	Date of Most Recent Recording	Potential for species within proposed development
Mammals			
Bat <i>Chiroptera</i>	27	2016	Limited foraging potential Possible roosting potential within farm buildings which are located approximately 170m SW of proposed turbine location
Daubenton's bat <i>Myotis daubentonii</i>	4	2011	Limited
Natterer's bat <i>Myotis nattereri</i>	1	1991	Limited
Pipistrelle <i>Pipistrellus pipistrellus</i>	4	2016	Limited
Long-eared bat <i>Plecotus spp.</i>	3	1991	Limited
Brown long-eared bat <i>Plecotus auritus</i>	1	1988	Limited
Badger <i>Meles meles</i>	3	2013	Potential foraging habitat
Otter <i>Lutra lutra</i>	6	2013	Limited foraging habitat within the proposed Development site Broadstone Reservoir lies approximately 700m NE of the proposed turbine location

Hedgehog <i>europaeus</i>	<i>Erinaceus</i>	18	2016	No
Water vole <i>amphibius</i>	<i>Arvicola</i>	100+	1979-2009	No
Birds Deemed At Risk From Proposed Wind Developments ¹⁴				
Grey heron <i>Ardea cinerea</i>		10	2012	No suitable habitat within the Development boundary Broadstone Reservoir lies approximately 700m NE of the proposed turbine location
Whooper swan <i>cygnus</i>	<i>Cygnus</i>	3	2007	Potential grazing habitat within and adjacent to the proposed Development
Pink-footed goose <i>brachyrhynchus</i>	<i>Anser</i>	6	2010	Potential grazing habitat within and adjacent to the proposed Development
Merlin <i>Falco columbarius</i>		2	2008	Potential foraging habitat within the local area
Peregrine <i>Falco peregrinus</i>		2	1991	Potential foraging habitat within the local area
Lapwing <i>Vanellus vanellus</i>		100+	2013	Potential nesting habitat depending on agricultural land use
Golden plover <i>apricaria</i>	<i>Pluvialis</i>	61	2013	potential wintering usage depending on agricultural land use
Herptile Species				

¹⁴ Natural England (2010) Assessing the effects of onshore wind farms on birds – Technical Information Note TIN069

Common toad <i>Bufo bufo</i>	12	2013	Limited habitat
Palmate newt <i>Lissotriton helveticus</i>	2	1975	Limited habitat
Smooth newt <i>Lissotriton vulgaris</i>	1	1975	Limited habitat
Common frog <i>Rana temporaria</i>	20	2013	Limited habitat
Great crested newt <i>Triturus cristatus</i>	1	1944	Limited habitat
Sand lizard <i>Lacerta agilis</i>	1	2010	No
Common lizard <i>Zootoca vivipara</i>	10	2014	Limited habitat

PROTECTED AND NOTABLE SPECIES IMPACT ASSESSMENT

Bats

- 4.29. Natural England’s guidance contained within Technical Information Note TIN051¹⁵ provides an assessment of the potential risk to an individual bat from each species, and also the risk to each species’ population from single wind turbines. This document deems Myotis species and long-eared bat species at low risk as individuals and as a population. Common pipistrelle are deemed to be at a medium risk as individuals, and at a low risk as an overall population.
- 4.30. Many species of bats generally commute and forage along linear features, such as a stream/river, hedgerow or woodland edges (this is true for pipistrelle and myotis species). However, on occasion they will cross open features, particularly species with strong echolocation such as noctule.
- 4.31. Table 4-3 below details general/preferred foraging and commuting habitat of each species recorded within the search area. Table extracted from standard guidance¹⁶.

¹⁵ Natural England (2012) *Technical Information Note TIN051*

¹⁶ Collins, J. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. BCT

Table 4-3: General/Preferred Foraging and Commuting Habitat, and Roosting Preference of Each Species Recorded

Species	Foraging And Commuting Habitat	Roosting Preferences
Daubenton's bat <i>Myotis daubentonii</i>	Preferred foraging habitat is over water; this species favours riverine habitats but is also known to forage in woodland.	Roosts are found in hollow trees, bridges or sometimes buildings generally close to water. Nursery roosts are not exclusively female – males make up 25% or more of the colony and large male-only colonies have also been recorded. Hibernation sites are usually underground including caves, mines and suitable tunnels where bats are found both in crevices and on open walls. They may also hibernate in tree cavities.
Natterer's bat <i>Myotis nattereri</i>	Preferred foraging habitat is semi-natural broad-leaved woodland, tree-lined river corridors and ponds, but also uses grassland. Avoids dense coniferous plantation. An autumn study revealed that the species use woodland and mixed agricultural areas.	Roost sites include tree holes and different types of buildings but has also been found in bridges. Usually roost in attics between late May and mid-July and often roosts have enough space for internal flights. This species also breeds in bat boxes. Timber-framed barns built between 12 th and 19 th centuries may be particularly important to this species, with roosts found in mortise joints in both summer and winter. Hibernates in cracks and crevices in caves and mines. Other hibernations sites recorded are canal and railway tunnels, ice houses and tree cavities.
Pipistrelle <i>Pipistrellus pipistrellus</i>	Shows a preference for deciduous woodland but a generalist using a wide range of habitats.	Maternity colonies are found mainly in buildings, usually roosting out of sight in crevices. Colonies may use a number of sites through the summer but are often loyal to the same sites for many years. Maternity colonies are extremely variable in terms of numbers, from 20 to over 1,000 bats.

		Males roost singly or in small groups in the summer, in buildings or trees. Bat boxes are used by both males and females but generally only males use them in the summer. These species do not use underground sites for hibernation but are sometimes found in the cracks and crevices of buildings in the winter.
Brown long-eared bat <i>Plecotus auritus</i>	Strongly associated with tree cover, prefers woodland with cluttered understory, including native species, particularly deciduous. Also forages in mixed woodland edge and among conifers. Use of hedgerows increase through the active season.	Maternity roosts found in the voids of large, old buildings and bat boxes in woodland. Usually roosts against wooden beams at the roof apex in attics or farm buildings. Bats often cluster at the highest part of the roof and require enough space for unobstructed, internal flight. Shows high roost fidelity. Common uses feeding perches and night roosts in porches or outbuildings separate from the main roost. Hibernate in underground sites, trees holes and buildings.

- 4.32. The proposed Development area and the adjacent land are open and exposed, which is sub-optimal habitat for foraging and roosting bats.
- 4.33. Approximately 700m to the NE lies Broadstone Reservoir which offers potential habitat for foraging bats, particularly Daubentons. A small copse of trees are present approximately 230m SE of the proposed turbine location, and are likely to offer suitable foraging habitat. As a formal survey has not been undertaken their potential for supporting roosting bats is currently unknown.
- 4.34. The grazed agricultural fields within and adjacent to the proposed Development are of limited foraging potential for local bat species. Although fields are bound by drystone walls, the current farming practices does not include unmanaged field margins which would lead to an abundance of prey sources for bats.
- 4.35. The relocation of the turbine further north from its existing location will not lead to an increase in the current impacts for local bats.

Badger

- 4.36. Although the land under and directly adjacent to the Development footprint offers potential foraging habitat, it is unlikely to support a sett. The short construction phase of the proposed development will not lead to disturbance, or exclusion from foraging habitat for local badger.
- 4.37. It is recommended that any excavation be securely covered, or a suitable means of escape (ramp at 45°) provided at the end of each working night to prevent accidental trapping of foraging badger.

Otter

- 4.38. Although the potential habitat for foraging otter is limited within the proposed Development, the Broadstone Reservoir offers suitable habitat for this species. It is therefore considered that this species may be present within the proposed Development and adjacent areas on occasion while foraging/commuting. The short construction phase of the proposed development will not lead to disturbance, or exclusion from foraging habitat for local otter.
- 4.39. It is recommended that any excavation be securely covered, or a suitable means of escape (ramp at 45°) provided at the end of each working night to prevent accidental trapping of foraging/commuting otter.

Birds

- 4.40. Main impacts on bird species from wind turbine developments include:
- Direct loss or deterioration of habitats;
 - Indirect habitat loss as a result of displacement by disturbance;
 - Mortality due to collisions with turbines and associated infrastructure; and
 - Increased energy expenditure due to a barrier effect of larger arrays or rows of turbines.
- 4.41. The footprint of the proposed development is very small and will occur on land that is currently of low ecological value. The land is also currently subject to moderate disturbance from the existing agricultural land use. As this habitat is of low value to local bird species the loss of this small area would be negligible for bird species present in the surrounding landscape.
- 4.42. Of the bird species returned by the data search, seven were deemed as sensitive to wind turbine developments, including lapwing, pink-footed goose and whooper swan.
- 4.43. Dependant of the land usage during the lifetime of the proposed Development it is considered that these species may be present within close proximity to the proposed turbine location.

However, given its location and small scale, it is considered that the potential impacts for these species will not be significant.

Herptiles

- 4.44. The proposed Development will not occur within land that is likely to support herptile species. It is therefore considered that the short construction phase of the proposed Development will not significantly impacts these species.

CONCLUSION

- 4.45. It is considered that the proposed Development will not significantly impact local ecology during the short construction phase or the operational phase. However, as a precautionary measure it is recommended that any excavation be securely covered, or a suitable means of escape (ramp at 45°) provided, at the end of each working night in order to prevent accidental trapping of foraging badger and otter.

5. NOISE IMPACT ASSESSMENT

INTRODUCTION

- 5.1. The objective of this assessment is to identify and describe any likely significant noise effects on Noise Sensitive Receptors ("NSR") during the operational phase of the proposed Development.
- 5.2. In order to assess the potential noise impacts of the proposed Development, this report identifies the current baseline characteristics of the Application Site and the surrounding area, as well as the predicted impacts. This allows for the identification of potential noise impacts and recommendation of mitigation measures where appropriate.
- 5.3. This chapter is supported by the following Appendices:
- Figure 5.1: Noise Monitoring Map
 - Appendix B: Manufacturers Noise Data

STATEMENT OF AUTHORITY

- 5.4. This NIA has been produced by Michael McGhee of Neo Environmental. Having completed a civil engineering degree in 2012, Michael became a technician member of the Institute of Acoustics in 2013 and has since worked in over 100 NIAs, ranging from solar and wind farms to large scale residential developments across the UK and Ireland.

LEGISLATION & PLANNING POLICY GUIDANCE

- 5.5. As part of this report the development will be assessed against existing national, regional and local policies and guidance. To understand the council policies, it is first necessary to assess the national frameworks and guidance to identify their true context.
- 5.6. The assessment has been collated and considered based on the following legislative, planning policy and guidance context:
- National Planning Policy Framework (NPPF)¹⁷

¹⁷ DCLG National Planning Policy Framework, March 2012, Found at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

- Planning Practice Guidance for Renewable and Low Carbon Energy¹⁸
- Noise Policy Statement for England (NPSE)¹⁹
- ETSU-R-97 (ETSU)²⁰
- Institute of Acoustics Bulletin Vol.34²¹
- A Good Practice Guide to the Application of ETSU-R-97 for Wind Turbine Noise Assessment (GPG)²²

5.7. The DEFRA document, NPSE, sets out the long term vision of the Government with regards to noise:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.*

5.8. The NPPF is the national policy framework under which all planning applications should be determined. The golden thread running through this policy is the ‘presumption in favour of sustainable development’. With specific reference to noise, paragraph 123 determines that planning decisions should aim to:

- “avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- mitigate and reduce to a minimum other adverse impact on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable

¹⁸ DCLG 2014 *Renewable and Low Carbon Energy* Found at <http://planningguidance.planningportal.gov.uk/blog/guidance/renewable-and-low-carbon-energy/>

¹⁹ DEFRA 2010 *Noise Policy Statement for England* Found at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf

²⁰ DTI ETSU-R-97 *The Assessment and Rating of Noise from Wind Farms*

²¹ Institute of Acoustics 2009 *Acoustics Bulletin Vol 34*.

²² Institute of Acoustics 2013 *A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise*.

restrictions put on them because of changes in nearby land uses since they were established; and

- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”

5.9. The key components of NPPF policy relate to the identification and mitigation of any potential impact from noise. This Noise Impact Assessment takes into account these central aims and assesses them in detail with particular regard being paid to the assessment procedure set out within ETSU.

5.10. Although the NPPF replaces the Planning Policy Statement 22: “Renewable Energy”, it provides no specific guidance for the assessment of wind turbine noise. The online Planning Practice Guidance for Renewable and Low Carbon Energy states:

“The report, ‘The assessment and rating of noise from wind farms’ (ETSU-R-97) should be used by local planning authorities when assessing and rating noise from wind energy developments. Good practice guidance on noise assessments of wind farms has been prepared by the Institute Of Acoustics. The Department of Energy and Climate Change accept that it represents current industry good practice and endorses it as a supplement to ETSU-R-97.”

5.11. Therefore, in line with current best practise and other relevant guidance, the ETSU document will be utilised to assess the noise impact of the proposed wind turbine development as well as the more recent GPG.

METHODOLOGY

Baseline Conditions

5.12. A desk based assessment has been conducted to identify NSRs where it is considered that there is potential for increased noise effects due to the Development.

5.13. Those residences closest to the proposed Development were identified as the key NSRs for the purposes of this assessment. The study area includes a selection of the closest receptors surrounding the Development (Figure 5.1 refers).

Modelling Noise Propagation

5.14. ETSU does not prescribe a method to predict the immission levels at the nearest residential properties, although demonstration of this is required as part of any planning application.

- 5.15. The recommended standard for wind turbine noise propagation highlighted in the GPG is ISO 9613-2²³ (ISO Model). This method can be used to obtain realistic and even conservative predictions of noise from a wind turbine during favourable propagation conditions (i.e. downwind or temperature inversions). This is only the case if the appropriate choice of input parameters and limited corrections are made: in particular, avoiding the use of the 'soft ground' factor and avoiding the effects of terrain screening.
- 5.16. The ISO 9613-2 algorithms take their acoustic input data from the octave band sound power output of the turbines. This allows for the calculation - on an octave band basis - of; the attenuation due to geometric divergence, atmospheric absorption and ground effects.
- 5.17. The following assumptions have been made for all predictions based on this method of calculation:
- Downwind propagation from each individual turbine.
 - $G = 0.5$ at source, middle and receiver.
 - A receiver height of 4.0m above ground level.
 - No screening effects from topography, vegetation or intervening buildings and structures.
 - An air absorption factor based on a temperature of 10°C and 70% relative humidity.
 - A 2dB subtraction from the LAeq to LA90.

Turbine Source Noise Data

- 5.18. When using a ground factor of $G=0.5$ as in this assessment, sound power levels should incorporate an allowance for measurement uncertainty. The following outlines data types which can be used, with guidance on accounting for uncertainties in turbine noise emission data.
- **Declared sound power** (in accordance with TS IEC 61400-14²⁴, on the basis of two or more tests): this can be used directly.
 - **Warranted or specified manufacturer data** can be used, provided that a margin to account for uncertainty has been included. This is more likely to be the case for warranted data than for specifications. If not, a correction factor to allow for uncertainty needs to be added to the values provided, and this should clearly be explained in the

²³ International Standards Organisation ISO9613-2 *Attenuation of sound during propagation outdoors*

²⁴ IEC Wind Turbines – Part 14: *Declaration of apparent sound power level and tonality values*

assessment. The presence of such an uncertainty margin can be established through comparison with at least one measurement report.

- When comparing warranted/specified data with results of a representative test report, obtained in accordance with the IEC 61400-11²⁵ standard, with a reported test uncertainty σ , a margin of 1.645σ (between 1 and 2dB(A)) between the tested and stated values over the majority of wind speeds represents a clear indication that suitable uncertainties have been incorporated.
- If the document prescribes a value of uncertainty or a correction factor applicable to the data then this can be added to the values stated, unless the above test is already satisfied.
- If no data on uncertainty or test reports are available for the turbine, then a factor of +2dB should be added.
- **Tested sound power:** in the absence of the above, the results of a test made in accordance with the IEC 61400-11 standard, including a reported test uncertainty σ , can be referenced. The reported sound power with the addition of a margin equal to 1.645σ can be used. In the absence of test uncertainty being stated in the report, then 2dB(A) should be used.

5.19. For the purposes of this assessment the **tested sound power** method will be used.

Tonality

5.20. The procedure outlined in ETSU recommends that a tonal penalty is added to the measured noise levels, if the tonal audibility of the candidate turbine is above a certain level, this has been followed. The GPG also suggests that due to the lack of information on tonality at receptor distances, the potential presence of tones should be controlled through the use of suitable planning conditions. Therefore, although the method prescribed in ETSU will be followed in this assessment it is also recommended that a suitable condition be drafted in any subsequent planning decision to further protect receptors from tonality.

Infrasound

5.21. Infrasound is a term used to describe sound at very low frequencies generally below 20 Hz. The potential for this to impact upon residences and individuals is of particular concern to some people living in the environs of wind turbine installations. However, based on all current

²⁵ IEC Wind Turbines – Part 11: Acoustic measurement techniques, November 2011

available information as well as guidance from the Institute of Acoustics, there is no concern in relation to the levels of infrasound likely to be produced by the proposed wind turbine generator at the separation distances involved.

- 5.22. The Institute of Acoustics Technical Note “Prediction and assessment of wind turbine noise”²⁶ states:

“we conclude that there is no robust evidence that low frequency sound (including ‘infrasound’) or ground-borne vibration from wind farms, generally has adverse effects on wind farm neighbours”

- 5.23. Based on this statement, a detailed assessment of the infrasound impacts has not been undertaken, as it is assumed that there will be no cause for concern relating to infrasound from the Development.

Deriving the Operational Noise Effects Criteria

- 5.24. In accordance with the recommendations of ETSU, the acceptance of the Development is established by comparing the noise levels produced from the combined operation of the wind turbines with appropriate noise limits at nearby residential properties.

- 5.25. Whilst ETSU presents a comprehensive and detailed assessment methodology for wind farm noise, it also sets out a simplified methodology:

“if the noise is limited to an LA90, 10min of 35dB(A) up to wind speeds of 10m/s at 10m height, then these conditions alone would offer sufficient protection of amenity, and background noise surveys would be unnecessary.”

- 5.26. The exception to the setting of both the daytime and night-time lower limits on the criterion curves occurs where a property occupier has a financial involvement in the Development. Where this is the case then, if the derived criterion curve based on 5dB(A) above the measured background noise level falls below 45dB(A), the lower noise limit at that property may be set to 45dB(A) during both the daytime and the night-time periods alike.

BASELINE

Noise Sensitive Receptors in Study Area

- 5.27. The co-ordinates of the NSRs can be found in **Table 5.1**. Note that the co-ordinates are taken from the curtilage of each property closest to the site boundary.

²⁶ Institute of Acoustics 2009 *Acoustics Bulletin Vol 34*

- 5.28. The curtilage is used to describe an existing domestic garden area boundary. It is not used to describe the entire extent of a land parcel.

Table 5.1: Noise Sensitive Receptors in Study Area

	NAME	EASTING	NORTHING	DISTANCE TO NEAREST PROPOSED TURBINE (M)	FINANCIAL INTEREST
Receptor 1	Upper Maythorne Farm	418609	405744	221	No
Receptor 2	Lower Maythorne	418737	405604	245	No
Receptor 3	Lower Maythorne Farm	418714	405602	254	No
Receptor 4	Maythorne	418572	405768	247	No

POTENTIAL EFFECTS

Noise Source

- 5.29. The location of the proposed wind turbine is given in **Table 5.2** and is shown on **Figure 5.1**.

Table 5.2: Location of Proposed Turbine

TURBINE	EASTING	NORTHING
Turbine 1	418809	405838

- 5.30. The candidate wind turbine specifications for the project are outlined in **Table 5.3**:

Table 5.3: Turbine Specification

TURBINE TYPE	Bergey
HUB HEIGHT (M)	15
ROTOR DIAMETER (M)	6.99
HEIGHT TO BLADE TIP (M)	18.50
GENERATING CAPACITY (MW)	0.01

Noise Measurement Test Results

5.31. Measurements of the noise emissions of the Bergey wind turbine are summarised in **Tables 5.4 and 5.5**. These levels have been taken from the Hayes Mackenzie report using the hub height levels at each wind speed with a standard wind shear calculation in order to get the standardised 10m data.

Table 5.4: Summary of 1/3 Octave Band Centres at 8m/s Winds

OCTAVE FREQUENCY	BAND CENTRE (Hz)	63	125	250	500	1000	2000	4000	8000	TOTAL
Sound Power Level, LWA (dB(A))		67.8	73.2	77.0	80.1	83.7	80.9	75.9	70.0	87.7

5.32. ETSU recommends the addition of penalties, where tonal noise of audibility 2dB or more are present, ranging from 1.5dB at a tonal audibility of 2dB to 5dB at audibility of 6.5dB or more. **Table 5.5** details the tonal penalties applicable to the Bergey and resulting effective sound power levels.

Table 5.5: Tonal Penalties and Effective Sound Power Levels

STANDARDISED 10 M INTEGER WIND SPEED (M/s)	3	4	5	6	7	8	9	10
Apparent Sound Power Level, LWA (dB)	75.4	77.8	80.3	82.8	85.2	87.7	90.2	92.6
Uncertainty * 1.645 (dB)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Applicable Tonal Penalty (dB)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Effective Sound Power Level, LWA (dB)	77.3	79.8	82.3	84.8	87.2	89.7	92.2	94.6

Results

5.33. **Table 5.6** below shows the predicted noise levels at the noise sensitive receptors within the study zone due to the Development.

Table 5.6: Predicted Noise Levels at Noise Sensitive Receptor

RECEPTOR NAME	REFERENCE WIND SPEED (STANDARDISED TO 10M HEIGHT) (M/s)							
	3	4	5	6	7	8	9	10
Upper Maythorne Farm	17.7	20.1	22.6	25.0	27.5	29.9	32.4	34.9
Lower Maythorne	16.8	19.1	21.6	24.0	26.5	28.9	31.4	33.9
Lower Maythorne Farm	16.4	18.8	21.2	23.7	26.1	28.6	31.0	33.5

Maythorne	16.7	19.1	21.5	23.9	26.4	28.9	31.3	33.8
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IMPACT ASSESSMENT

- 5.34. **Table 5.7** shows a comparison of the predicted noise levels with the recommended noise limits, respectively, for each NSR. The term ‘exceedance’ is used to denote the difference between the predicted wind turbine noise level and the recommended limit. A negative value (in brackets) indicates that the predicted noise level is within the limit.
- 5.35. Noise levels at all locations are within the noise limits for all wind speeds considered.

Table 5.7: Comparison of Predicted Against Noise Limits

RECEPTOR	REFERENCE WIND SPEED STANDARDISED TO 10M HEIGHT (m/s) (LA90)							
	3	4	5	6	7	8	9	10
Upper Maythorne Farm	17.7	20.1	22.6	25.0	27.5	29.9	32.4	34.9
Criteria	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Exceedance	(17.3)	(14.9)	(12.4)	(10.0)	(7.5)	(5.1)	(2.6)	(0.1)
Lower Maythorne	16.8	19.1	21.6	24.0	26.5	28.9	31.4	33.9
Criteria	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Exceedance	(18.2)	(15.9)	(13.4)	(11.0)	(8.5)	(6.1)	(3.6)	(1.1)
Lower Maythorne Farm	16.4	18.8	21.2	23.7	26.1	28.6	31.0	33.5
Criteria	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Exceedance	(18.6)	(16.2)	(13.8)	(11.3)	(8.9)	(6.4)	(4.0)	(1.5)
Maythorne	16.7	19.1	21.5	23.9	26.4	28.9	31.3	33.8
Criteria	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Exceedance	(18.3)	(15.9)	(13.5)	(11.1)	(8.6)	(6.1)	(3.7)	(1.2)

SUMMARY AND CONCLUSIONS

- 5.36. This NIA presents an assessment of the noise effects on NSRs during the operational phase of the Development. A number of residential properties in the vicinity of the proposed development have been selected to identify potential impacts. An impact assessment has

been conducted at each of these properties comparing baseline data and derived assessment criteria against predicted noise levels.

- 5.37. Operational noise was assessed in accordance with the methodology set out in ETSU and the recently released GPG. ETSU noise limits have been derived from the simplified criteria.
- 5.38. This assessment has been based on the use of the tested manufacturer's data, which is typical of the size and type of turbine which has been considered for this project, and assuming worst case downwind propagation scenarios.
- 5.39. In addition, consultation with the Council Environmental Health Officer resulted in no cumulative assessment being required due to the small scale of the turbine as well as distance to the other turbines in the area.
- 5.40. Applying the ETSU derived noise limits at the assessment locations has demonstrated that the noise criterion can be satisfied at the required wind speeds.

6. SHADOW FLICKER

- 6.1. The following is the definition of Shadow Flicker according to Planning Practice Guidance for Renewable and Low Carbon Energy (Department for Communities and Local Government):

"Under certain combinations of geographical position, time of day and time of year, the sun may pass behind the rotor and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off; the effect is known as 'shadow flicker'."

- 6.2. The Microgeneration Certificate Scheme (MCS) document "Micro generation Installed Standard @ MIS 3003" sets out a diagram of where shadow flicker could be an issue around the wind turbine locality. It is standard that any shadow flicker effects at a distance beyond 10 rotor diameters are expected to be minor and of short duration and can safely be ignored. The rotor diameter of the proposed turbine is 6.99m and therefore shadow flicker effects are not expected to extend beyond 69.9m.

- 6.3. The closest receptor to the wind turbine is Upper Maythorne Farm which is 197m from the proposed turbine location. As this is beyond the 69.9m rotor diameter buffer it can be concluded that shadow flicker will have no impact and does not need to be considered further.

7. APPENDICES

APPENDIX A – FIGURES

- Figure 2.1 – Site Layout Map
- Figure 2.2 – Site Location Map
- Figure 2.3 – Turbine Schematic
- Figure 3.1 – Zone of Theoretical Visibility to 5km
- Figure 3.2 – Cumulative Map to 5km
- Figure 3.3a – Viewpoint 1 Photomontage 50mm
- Figure 3.3b – Viewpoint 1 Photomontage 75mm
- Figure 3.4a – Viewpoint 2 Photomontage 50mm
- Figure 3.4b – Viewpoint 2 Photomontage 75mm
- Figure 4.1 – Environmental Designations Map
- Figure 5.1 – Noise Assessment Map

APPENDIX B – MANUFACTURERS NOISE DOCUMENT

APPENDIX C – CUMULATIVE TURBINES

Note: ID – Denotes corresponding number on the Cumulative Map (Figure 3.2)

ID	Address	Status	Easting	Northings	Turbine Blade Tip Height (m)
1	Dearne Head Farm, Huddingley Lane, Cumberworth, Huddersfield, HD8 8YD	Consented	418463	407238	22
2	Land to East of, Broadstone Road, Huddersfield, HD8 8YF	Operational	420166	406641	25
3	Meadow Nook Farm, Huddingley Lane, Cumberworth, Huddersfield, HD8 8YA	Operational	419076	408238	20
4	Upper Woodroyd Barn, Hog Close Lane, Holmfirth, HD9 7TE	Operational	418072	405864	20
5	Walkers Barn, Bedding Edge Road, Hepworth, Huddersfield	Operational	417468	405253	20
6	Broadstone Lodge Farm, Broadstone Road, Cumberworth, Huddersfield, HD8 8YF	Operational	420364	406460	34
7	Delph House Farm, Penistone Road, High Flatts, Huddersfield, HD8 8XY	Operational	421753	406576	34
8	QUARRY HOUSE FARM, Penistone Road, High Flatts, DENBY DALE, HUDDERSFIELD, HD8 8XY	Operational	421631	406833	34
9	Shaley Farm, Shaley, Sandy Gate, Scholes, Holmfirth, HD9 1RY	Operational	415279	407674	34
10	Manor House Farm, The Village, Thurstonsland, HD4 6XU	Consented	416532	410001	20

11	Martins Nest Farm, Hog Close Lane, Hepworth, Holmfirth, HD9 7TG	Consented	418138	406093	18
12	Longley Farm/Off, Dunford Road, Holmfirth.	Operational	414790	406180	32
13	Blackstone Edge Wind Farm	Operational	419656	405295	101
14	Royd Moor Wind Farm	Operational	420746	404611	54.5
15	Hazlehead Wind Farm	Operational	417941	404273	100
16	Spicer Hill Wind Farm	Operational	420568	405026	95
17	Martins Nest Farm, Grime Lane, Victoria	Operational	418359	406436	34.2
18	Broadstone Reservoir, Browns Edge Road, Hepworth	Operational	419427	406010	34.2
19	Cockle Edge Farm, Huddersfield Road, Ingbirchworth	Operational	423054	405424	34.2
20	Bullhouse Mill House Lee Lane Millhouse Green Sheffield S36 9NN	Operational	421036	403087	25
21	Drake Hill Farm, Hey Slack Lane, Cumberworth, West Yorkshire, HD8 8YD	Operational	418505	406802	19.3
22	Land at Upper Maythorn Lane, Whitley Common, Barnsley, HD9 7TF	Operational	418734	405695	19.75
23	Thurlmoor Farm, Brook Hill Lane, Carlecotes, Sheffield, S36 4TD	Operational	417670	403072	19.8
24	Heyside Farm	Not determined	418184	407008	67
25	Lower Holme House Farm, Holme House Lane, New Mill, Holmfirth, HD9 7HJ	Consented	417324	408385	20.34
26	159, Lane Head Road, Shepley, Huddersfield, HD8 8BW	Consented	419363	409062	18.49

27	location Bullhouse Mill House, Lee Lane, Millhouse Green, Sheffield, S36 9NN	Operational	420978	403042	13
28	New Maythorne Farm, Lower Maythorn Lane, Crow Edge, Holmfirth, HD9 7TW	Not determined	419303	405184	67
29	Greenfield House, Green Lane, High Flatts, Huddersfield, HD8 8XU	Operational	421214	407037	17.75
30	Lower Huddingley Farm, Huddingley Lane, Cumberworth, Huddersfield, HD8 8YA	Operational	418912	408165	17.75
31	Upper Holme House Farm, Hirst Lane, Cumberworth, Huddersfield, HD8 8GA	Operational	417660	408111	17.3
32	Heather Lodge, Penistone Road, High Flatts, Huddersfield, HD8 8XY	Consented	421314	407007	17.8
33	Green Lane Head Farm, Green Lane, High Flatts, Huddersfield, HD8 8XU	Not determined	420920	406850	34.2
34	Wild Boar Farm, Hade Edge, Holmfirth, HD9 2TB	Operational	415203	405028	34.2
35	Cote Farm, Penistone Road, Hade Edge, Holmfirth, HD9 2TA	Operational	415608	405204	34.2
36	Coal Pit Lane, Lower Cumberworth, Huddersfield, HD8 8PL	Consented	421764	409802	39.92
37	Longley Farm, Holmfirth, HD9 2JD	Consented	414779	406174	46
38	Bedding Edge Road, Hepworth, Holmfirth, HD9 1TP	Consented	417447	405273	36.55
39	Land off Hog Close Lane, Victoria, Hepworth, Holmfirth, HD9 7TG	Consented	418155	406232	36.55