Stubsgill Farm, Wind Turbine Repowering

Planning Statement

Prepared for

Constantine Wind Energy

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Document Control

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1.0 INTRODUCTION AND BACKGROUND

1.1 Purpose and structure of this document

1.1.1 This Planning Statement has been prepared in support of a planning application made on behalf of Constantine Wind Energy (hereafter referred to as 'CWE' or 'the Applicant') to install and operate a single replacement wind turbine up to 76m tall ('the Proposed Development') at an existing wind turbine site located at Stubsgill Farm, Distington, Workington ('the Site'). This process is known as repowering. The Site lies wholly within the administrative area of Cumberland Council (CC) as the Planning Authority.

1.1.2 The application represents the repowering of a single 250 kW turbine approved in May 2013 (ref: 4/13/2173/0F1).

1.1.3 The location of the Site is shown in Image 1.1 below:

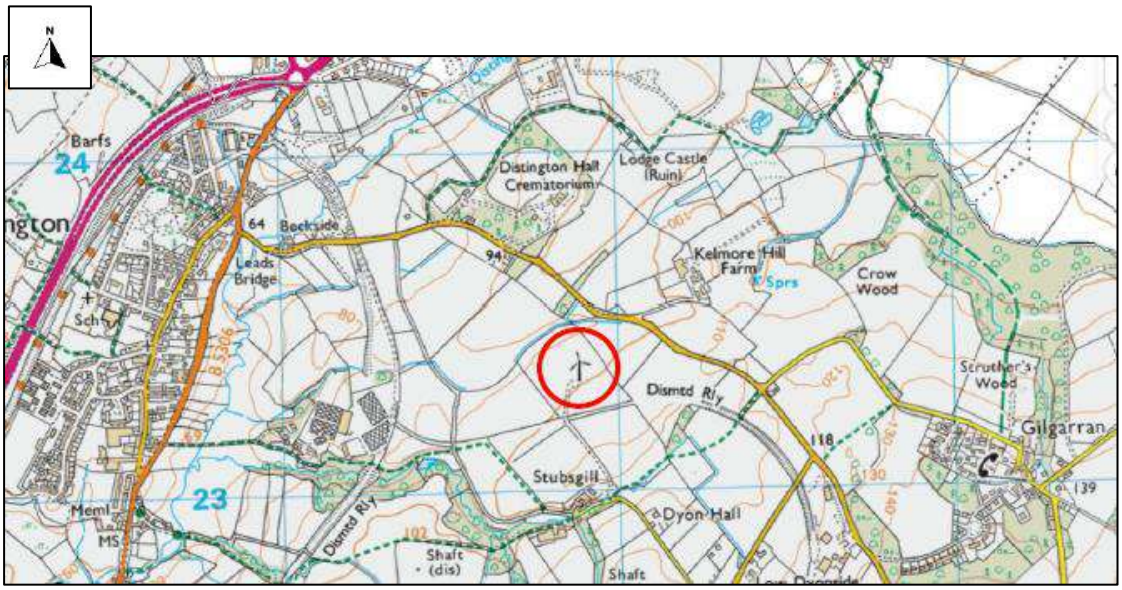

Image 1.1 – Site location

1.1.4 The application is contained within the following documentation:

i) The planning application form.
ii) Land ownership certificates.
iii) Planning application drawings:
   a. Location Plan.
   b. Site Plan.
   c. Turbine Access Arrangements.

d. Existing and Proposed Elevations.
e. Turbine Site Area

iv) Planning Statement.
v) Preliminary Ecological Appraisal.
vi) Landscape and Visual Impact Assessment.
vii) Shadow Flicker Assessment.
viii) Noise Assessment.

1.1.5 This Planning Statement is divided into seven main sections. Following on from this Introduction, the sections are set out as follows:

i) Section 2.0 provides a description of the Site, its surroundings and its planning history.
ii) Section 3.0 provides a description of the Proposed Development.
iii) Section 4.0 addresses the need for and benefits of the Proposed Development.
iv) Section 5.0 sets out the planning policy context against which the Proposed Development will be determined.
v) Section 6.0 sets out the planning assessment, demonstrating how the Proposed Development accords with the statutory development plan.
vi) Section 7.0 provides a summary and draws a concise conclusion regarding the acceptability of the Proposed Development in planning terms.

1.2 The Applicant

1.2.1 The Applicant is an owner, manager and maintainer of onshore wind turbines, with 198 turbines located throughout Great Britain. These are mainly FIT eligible turbines, which are managed with market leading operational and maintenance expertise and supported by proprietary asset management software. As part of a repowering programme to maximise efficiencies within its portfolio, the Applicant has the support of the Landowner of Stubsgill Farm to progress the repowering at the Site.

1.3 Need for Environmental Impact Assessment

1.3.1 Wind turbine projects are specifically defined in the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 under Schedule 2, Part 3 ‘Energy Industry’ Section (i) Installations for the harnessing of wind power for energy production (wind farms). The specified screening threshold is: “*the development involves the installation of more than two turbines, or the hub height of any turbine or the height of any other structure exceeds 15m.”*

1.3.2 Whilst the Proposed Development is for a single turbine, the proposed hub height of this turbine is 50m. On this basis, the Proposed Development formed Schedule 2 development due to the exceedance of the 15m hub height threshold. However, considering that the proposal represents the repowering of an existing turbine and based on our knowledge and experience of other similar schemes, it is unlikely that it will result in any significant environmental effects.

1.3.3 As such, whilst it is acknowledged that the LPA will need to screen the application to understand if a formal Environmental Impact Assessment (EIA) is required, no request for a screening opinion has been made prior to its submission.

1.4 Consultation

1.4.1 In accordance with the Town and Country Planning (Development Management Procedure) (England) Order SI 2015/595[1], the Applicant has elected to undertake a community consultation exercise ahead of any formal planning submission to effectively inform local residents of the Proposed Development.

1.4.2 The consultation event was held on 15 May 2024 at Distington Community Centre between the hours of 3pm and 7pm. The event was advertised through a targeted leaflet drop which included properties within 1km catchment of the Proposed Development. A copy of the distributed leaflet has been provided within Appendix B.

1.4.3 The consultation event detailed the changes the Proposed Development entails comparative to the existing wind turbine. A total of 4 people attended the event between the specified hours, with all feedback requested via dedicated e-mail address over a subsequent two week period.

1.4.4 The feedback received through the consultation exercise is summarised in Table 1 below, with actions taken where relevant.

Table 1.1 - Consultation feedback and actions

Feedback	Action
The viewpoints selected for the LVIA did not appear to pick up any views from residential receptors to the south of the turbine.	A further site visit was undertaken on 31 May 2024 to take further viewpoint photography from the south of the turbine. As a result, an additional viewpoint (Viewpoint 9) has been included within the LVIA.

[1] *Part 2 - Pre-application consultation - 3. Consultation before applying for planning permission - https://www.legislation.gov.uk/uksi/2015/595/article/3*

2.0 THE SITE AND ITS SURROUNDINGS

2.1 Site context

2.1.1 The Site is located to the north of Stubsgill Farm, off an unnamed road and situated circa 1km to the east of Distington. The OS Grid Reference for the existing wind turbine is NY 01884 23328, what3words: encoding.tomato.hype.

2.1.2 The Site comprises an area of land within an agricultural field that has undergone a degree of rewilding due to a lack of cultivation. It is situated within a wider area of agricultural land, which includes pockets of woodland. The majority of land is classed as land capable of producing moderate to high yields of a narrow range of crops.

2.1.3 Access to the Site is via a purpose-built access track, consented under planning permission ref: 4/13/2173/0F1. This access is formed directly from Stubsgill Farm.

2.1.4 Discounting Stubsgill Farm, the nearest residential dwelling is at Kelmore Hill Farm, which is approximately 440m to the northeast of the existing wind turbine. The next nearest residential property is at Dyonhall Farm, approximately 470m southeast of the Site.

2.1.5 The Site is not located within any designated site for nature conservation, cultural heritage or landscape purposes and there are no statutory or non-statutory designations within 2km of the site. The closest designated ecological asset is the River Derwent SSSI located circa 4.5km east of the Site.

2.1.6 In terms of heritage assets, there is a Grade II Listed Building approximately 380m to the south of the Site in the form of “Stubsgill Farmhouse, Area Wall and Gate Piers, and Byre”. There are a number of further Listed Buildings in the area, with the closest being the Grade II listed “Distington War Memorial” approximately 1.4km to the west.

2.1.7 A review of flood data available from GOV.UK’s Flood Map for Planning[2] illustrates that the Site is located within Flood Zone 1 and is therefore not at risk of any surface water, coastal or river flooding.

[2] https://flood-map-for-planning.service.gov.uk

2.2 Planning history

2.2.1 The Proposed Development would lie entirely within the administrative area (and planning jurisdiction) of Cumberland Council (CC).

2.2.2 A review of the CC public access system has highlighted the below planning history for the Site and immediately adjoining sites. These are set out in the Table 2.1 below.

Table 2.1 – Planning history

Application Reference	Description of Development and Site Location	Status
4/15/2246/0F1	Installation and operation of a single wind turbine up to 45.5m to tip and associated infrastructure	Refused - September 2015
4/13/2173/0F1	Installation of a single 250kw wind turbine (with a maximum height of 45.5m to blade tip) and associated infrastructure	Approved - August 2013
4/13/2174/0F1	Installation of a 15m high anemometer mast for a period of 6 months	Approved - May 2013

3.0 THE PROPOSED DEVELOPMENT

3.1 Turbine replacement

3.1.1 The Site currently operates a single 250kW turbine, which has a 30m hub height and incorporates 30m diameter blades. This results in a 45m tip height.

3.1.2 The Proposed Development would have a rated operating capacity of 250kW to satisfy current grid connection arrangements. Whilst this output is consistent with the existing turbine, energy production onsite would be increased due to improved wind to energy conversion efficiency, heighted reliability, increased wind speeds at taller heights, and a larger swept area of wind capture.

3.1.3 The key maximum parameters of the Proposed Development are set out below:

i) Output: 250kW.
ii) Hub height: 50m.
iii) Blade length: 26m.
iv) Blade diameter: 52m.
v) Maximum height to blade tip: 76m.
vi) Number of blades: 3.

3.1.4 The proposed maximum turbine dimensions are illustrated on Planning Drawing 3369-091-TS-003. Whilst the candidate turbine is a Vestas V52, the Applicant is applying for planning consent for a wind turbine with a maximum blade tip height of 76m to encompass minor variances across the wind turbine market for this class of machine. The turbine elements would be in a light grey matt finish or similar.

3.2 Foundations

3.2.1 The foundation pad for the Proposed Development is located approximately 20m to the northwest of the existing turbine foundation, as shown on Planning Drawing 3369-091-SP-002, for which the Applicant requests a 10m micrositing to allow for any unforeseen conditions on site. The final design of the foundation and reinforcement would be completed following ground investigations and detailed engineering design prior to construction.

3.3 Access track

3.3.1 Access for construction and maintenance of the Proposed Development would be via a new access track from the main road to the north, which is included as part of this planning application. Due to the minor variances that are associated with the installation of wind turbines, the Applicant requests a 1m micrositing of the proposed access track to allow for any unforeseen conditions on site.

3.4 Crane hard standing/lay down areas

3.4.1 A crane hard standing area is required to accommodate removal, maintenance and erection works. The existing crane pad requires expansion to account for the larger component sizes of the proposed turbine. It is proposed that the hardstanding is extended both through the reuse of the existing turbine foundations and takeover of a small area of unused land on the southern, eastern and western edges of the existing crane pad. The existing hardstanding and turbine foundation areas to be reused and the proposed extended crane pad area for the mobile cranes and laydown of turbine components are illustrated on Planning Drawing 3369-091-SP-002.

3.4.2 The replacement turbine would be erected using two mobile crane units to lift the tower sections, nacelle and rotor components into position. It is anticipated that it would take approximately six weeks to complete the installation and commissioning of the turbine, after which the cranes would be removed from site.

3.5 Turbine removal

3.5.1 The existing turbine will be removed in a controlled manner in a reverse sequence to that of installation. In summary this process will include:

i) Locating and securing of mobile crane units on new foundation pad.
ii) Removal of turbine blades.
iii) Removal of blade hub.
iv) Removal of nacelle.
v) Modular deconstruction of turbine tower.
vi) Transportation of components off-site.

3.6 Switchgear container and associated cabling

3.6.1 The replacement turbine will make use of the existing switchgear building and cabling installed to serve the existing turbine. The switchgear container is located immediately adjacent to the turbine base. The container houses the switch gear, transformer and generation meters required for the operation of the proposed turbine. These features are illustrated in Planning Drawing 3369-091-SP-002.

3.6.2 The Site is connected via underground cabling, with the pre-existing ancillary infrastructure providing sufficient capacity for the Proposed Development. As such, no new grid connections are required with the existing cabling providing optimal functionality.

3.7 Turbine delivery

3.7.1 The Site, whilst somewhat isolated, is located 1.2km southeast of the A595, which runs from Carlisle to the A590 trunk road at Dalton-in-Furness. The wider access route for the delivery of the turbine and associated equipment is shown on Drawing 3369-091-TA-004.

3.7.2 The turbine delivery vehicles would access the Site via a new purpose-built access track to the east that is specifically required to accommodate the required construction vehicles.

3.7.3 Temporary traffic management is likely to be required for the delivery of abnormal loads and it is suggested that this is controlled through a suitably worded planning condition requiring the submission of a construction traffic management plan.

3.8 Traffic generation

3.8.1 During construction and operation of the replacement turbine, traffic will consist of the following:

i) **Access track:** 40 loads from. 8t (per axle) tipper & grader/roller (4 axles).
ii) **Site staff:** 4 No. cars/light vans per day throughout construction period.
iii) **Foundations:** Excavator delivery and removal on standard low loader, 3 No. HGV movements for delivery of steel reinforcement and anchor cage, approximately 26 No. concrete vehicle movements.
iv) **Turbine delivery/installation:** Two mobile cranes (approximately 90t tail crane and 300t main crane), requiring 5 No. HGV movements for cranes and ancillary

crane plant. Subject to the specific model of turbine procured, the turbine will be delivered to site in approximately 7 No. HGV/abnormal loads with approximate dimensions (L x W x H) as follows:

a. HGV 1-Blades (29.5m x 2.5m x 4.0m).
b. HGV 2-Hub & Nacelle (16.5m x 3.0m x 4.0m).
c. HGV 3-Top Tower (27.5m x 2.8m x 4.0m).
d. HGV 4-Bottom Tower (27.5m x 3.65m x 4.15m).
e. HGV 5-Tower Anchor (18.5m x 2.5m x 4.3m).
f. HGV 6 & 7-Converter Cabinets & Tools (16.5m x 2.5m x 4.0m).

v) **Operation:** A light goods vehicle for maintenance crew would normally be required, with quarterly inspections requiring four vehicle movements per year. In the rare event of major component failure, the relevant item will need to be replaced and therefore crane and delivery of replacement parts will be required.

3.8.2 The removal of the existing turbine and deliveries associated with the new turbine will be managed in a way to minimise vehicle movements where possible, so that delivery vehicles can be loaded with elements of the existing turbine for the return journey. This will reduce the overall number of vehicle trips required for the Proposed Development. However, worst case is that the existing turbine is removed from site in a similar way to the delivery schedule outlined above.

3.9 Programme

3.9.1 The construction of the Proposed Development would be undertaken over a 6-week period and is anticipated to commence in Q1 2025. An indicative construction programme, outlining the duration of the main construction activities is included below in Table 3.1.

Table 3.1 - Indicative Construction Programme

Task	Week							
	1	2	3	4	5	6	7	8
Civils Works								
Foundations Cure								
Electrical Works								
Existing Turbine Decommissioning								
New Turbine Installation								
New Turbine Commissioning								
Handover to Client								

Construction Hours

3.9.2 Construction would generally be limited to 07.00 to 19.00 Monday to Friday and 07.00 to 13.00 Saturday (with no work on Sundays or Bank Holidays).

Decommissioning

3.9.3 The replacement turbine is expected to operate for 25 years, unless consents are sought to further repower the site, either through extending the life of the turbine or subsequent replacement.

3.9.4 It is not considered likely that any additional environmental effects would be experienced as a result of decommissioning to those likely to arise during construction.

3.9.5 Details of the decommissioning process will be agreed in writing with CC in accordance with a suitable worded planning condition. This planning condition will be required to be discharged prior to any decommissioning taking place. It is likely that decommissioning will require the use of the same route as for construction, but these details will be confirmed as part of the discharge of the planning condition.

3.9.6 Where practicable, turbine components that can be salvaged for reuse within the wind energy industry will be removed prior to further waste processing. Where materials cannot be salvaged, they will be recycled, reused for other purposes, or disposed of.

4.0 THE NEED FOR WIND TURBINE REPOWERING

4.1 Introduction

4.1.1 This section of the Planning Statement sets out the benefits of, and need for, the repowering of existing wind turbines in the context of UK wide, national, and local energy policy and strategy.

4.2 The case for wind turbine repowering

4.2.1 The concept of repowering is to make better use of existing wind energy developments, which often were typically conditioned to limit the lifetime of the development to around 25 years. At the risk of losing considerable amounts of renewable energy capacity upon decommissioning, there is a potential for significant detrimental impacts on the United Kingdom's required trajectory towards net zero.

4.2.2 There are a number of advantages of pursuing a repowered site over a new development at a greenfield site. There is a considerable benefit in using existing and proven infrastructure, such as the access roads to the Site, and the turbine foundation pads, which can be used to site cranes during construction. This will often have a benefit in reducing impacts on the natural environment, particularly biodiversity and landscape by minimising the development footprint when compared to a completely new development.

4.2.3 Existing turbine sites also allow for real world data to be collated regarding turbine performance and electricity generated. The first tranche of onshore turbines within the UK were often being deployed at the windiest locations, largely due to high winds helping to counter-act the technical inefficiencies of first-generation turbines. This data can be used to help inform choices regarding the sites that can be repowered, or at least the ordering of any repowering programme, which helps increase generation capacity at a more advanced pace.

4.2.4 Redundant turbines, removed from repowered sites can also play an important role in the wider wind energy industry, by providing spare parts for the same model of turbines currently deployed and envisaged to operate for the entirety of their lifetime. Many turbines are simply not in production anymore; thus the reuse of turbine component parts is integral to the future viability of many turbines currently in operation.

4.2.5 Whilst there is not a singular definition of repowering, the House of Commons has, in its recent Research Briefing on Planning for onshore wind, provided an indirect definition of wind turbine repowering in section 3.2. Here it defines repowering as *"removing old turbines and replacing them with newer, more efficient models"*.

4.2.6 The Government's position on repowering is reaffirmed in paragraph 163 of the NPPF, which states that *"in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site, and approve the proposal if its impacts are or can be made acceptable."* This is particularly relevant when considering the scale of planned wind turbine decommissioning over the next 25 years.

4.3 National energy policy, strategy and guidance

The Climate Change Act 2008 (2050 Target Amendment) Order 2019

4.3.1 The Climate Change Act 2008 set a legally binding target for the United Kingdom (UK) to achieve an 80% reduction in greenhouse gas emissions by 2050, from a 1990 baseline. However, the Government have since decided that this legally binding target was not ambitious enough to mitigate the nation's activities on climate change.

4.3.2 On 1st of May 2019, an Environmental and Climate Change Emergency was declared following the findings of the Inter-governmental Panel on Climate Change (IPCC). They confirmed that, to avoid a more than 1.5°C rise in global warming, global emissions would need to fall by around 45 per cent from 2010 levels by 2030, reaching net zero by around 2050.

4.3.3 In June 2019, the UK Government laid before parliament the draft Climate Change Act 2008 (2050 Target Amendment) Order 2019 to amend the Climate Change Act 2008 by introducing a target for at least a 100% reduction of greenhouse gas emissions (compared to 1990 levels) in the UK by 2050. This is otherwise known as the net zero target. The draft order amended the 2050 greenhouse gas emissions reduction target in the Climate Change Act from at least 80% to at least 100%. It is therefore a legally binding commitment to end the UK's contribution to climate change. The Order came into force in late June 2019.

Sixth Carbon Budget (2021)

4.3.4 Since the Clean Growth Strategy was updated in April 2018 the Sixth Carbon Budget, required under the Climate Change Act, has been published. On the 20 April 2021 the UK government announced that it would adopt the recommendations and enshrine them in law, and the legislation was set out to parliament on 21 April 2021. The Sixth Carbon Budget provides advice on the volume of greenhouse gases that the UK can emit during the period 2033-2037. This would involve setting the most ambitious climate change target in the world of a reduction of 78% by 2035. One of the four key steps to achieving this target is the expansion of low-carbon energy supplies (such as the Scheme), with UK electricity production achieving zero carbon emissions by 2035. This is a dramatic step-change and will logically require more emphasis on renewable energy as part of a suite of measures to achieve this target.

4.3.5 The Electricity Generation Sector Summary for the Sixth Carbon Budget sets out on page 14 that:

'With 14 GW, onshore wind currently takes up 2,700 km2 of land. To deploy 30 GW of onshore wind could need an additional 3,300 km2 of land.'

4.3.6 To maximise the potential of onshore wind generation in the context of the Sixth Carbon Budget and to achieve the Government's Net Zero Target by 2050 could require an additional 330,000 hectares of land. This highlights the scale of the challenge to deliver Net Zero by 2050.

The Sixth Carbon Budget: The UK path to Net Zero (December 2020)

4.3.7 The Sixth Carbon Budget: The UK path to Net Zero, was published by the Climate Change Committee (CCC) in December 2020. Page 135 of the main report describes how decreasing the carbon intensity of electricity generation is a key aspect of providing a balanced Net Zero pathway for electricity generation. To facilitate this, it is noted that "*Wind, particularly offshore, is the backbone of the system, providing 265 TWh of generation in 2035 and 430 TWh in 2050. That requires deploying 3 GW per year of new wind capacity, plus repowering of older sites as they reach the end of their (25-30 year) operating lives."*

4.3.8 As such, to achieve the CCC's balanced pathway it will be necessary to develop additional wind generating capacity to facilitate the push for decarbonised electricity.

Energy White Paper – Powering our Net Zero Future (December 2020)

4.3.9 In December 2020, the Department for Business Energy and Industrial Strategy (BEIS) published the Energy White Paper Powering our Net Zero Future.[3] This White Paper addresses the transformation of our energy system and how the UK will clean up its energy system and reach Net Zero emissions by 2050. The Paper reiterates on page 45 that *"Onshore wind and solar will be key building blocks of the future generation mix, along with offshore wind. We will need sustained growth in the capacity of these sectors in the next decade to ensure that we are on a pathway that allows us to meet net zero emissions in all demand scenarios."*

4.3.10 Therefore, it is clear that the Government sees onshore wind as a key component in ensuring energy security.

National Policy Statements (NPS)

4.3.11 Overarching National Policy Statement for Energy (EN-1), published in January 2024, forms part of a suite of NPSs issued by the Secretary of State for Energy Security and Net Zero, and sets out the government's policy for delivery of major energy infrastructure. The current NPS EN-1 updates the previous policy statement to reflect the Net Zero target by 2050. NPS EN-1 states at paragraph 3.3.20 that:

'Wind and solar are the lowest cost ways of generating electricity, helping reduce costs and providing a clean and secure source of electricity supply (as they are not reliant on fuel for generation). Our analysis shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar.'

4.3.12 The revised target of net zero by 2050 and therefore introduces an even greater imperative to deliver increased renewable energy schemes, as a matter of utmost urgency.

[3] *Department for Business, Energy and Industrial Strategy (December 2020) The Energy White Paper Powering our Net Zero Future*

British Energy Security Strategy (April 2022)

4.3.13 The British Energy Security Strategy[4] was published in April 2022. The strategy increases the previously stated 40GW target (from the White Paper) to 50GW by 2030.

4.3.14 Under the sub-heading of 'Onshore wind' the Strategy sets out that: *"We will also look at arrangements to support the repowering of existing onshore wind sites when they require updating or replacement. With advances in technology this process can enhance capacity and provide new opportunities for communities to benefit"* (page 18).

Powering Up Britain

4.3.15 The Powering up Britain policy papers were published in March 2023, setting out how the government will enhance the UK's energy security, seize the economic opportunities of the transition, and deliver on Net Zero commitments.

4.3.16 Much of the paper is dedicated to outlining strategies for decarbonisation and reducing emissions, and the numerous opportunities for growth within the economy and within industry that this process can create. The UK government hopes to be a driver behind international collaboration and continue as a world leader in the drive towards Net Zero.

4.3.17 A key message within the policy documents is that taking these opportunities requires a bold approach; "the transition to net zero will require action across the whole economy fuelled by rapid deployment of low carbon electricity".

4.3.18 Significance is placed on accelerating the deployment of renewables, with the stated goal "to quintuple our solar power by 2035", recognising that "onshore wind is an efficient, cheap and widely supported technology".

Net-Zero Strategy: Build Back Greener 2021

4.3.19 In October 2021, the Department for Energy Security and Net Zero in association with the Department for Business, Energy and Industrial Strategy published the

[4] *HM Government (April 2022) British Energy Security Strategy: Secure, clean and affordable British energy for the long term*

Policy Paper outlining the UK's net zero strategy[5]. The policy is underpinned by a desire to remove fossil fuels from the UK energy base and ramp up the deliverability of renewable energy projects.

Climate Change Committee 2023 Progress Report: Progress in reducing UK emissions

4.3.20 The progress report was made in response to the release of the government's plans for Net zero and publication of the Carbon Budget Delivery Plan (CBDP). It notes that *"policy development continues to be too slow".*

4.3.21 One of the key messages from the report is that "*the expansion of fossil fuel production is not in line with Net Zero - The planning system must have an overarching requirement that all planning decisions must be taken giving full regard to the imperative of Net Zero".*

4.4 Summary of need

4.4.1 It can be seen from the above review that the national policy message on energy security is strong and unambiguous. There is a clear need to ensure security of supply through the development of a diverse energy generation system to support the increased peak demands and the move to electric vehicles.

4.4.2 The repowering of existing renewable energy facilities, particularly existing wind turbines, is a key component of the future energy mix in the UK. This is specifically the case if ambitious UK renewable energy targets are to be met.

[5] https://www.gov.uk/government/publications/net-zero-strategy

5.0 PLANNING POLICY CONTEXT

5.1 Introduction

5.1.1 This chapter of the Planning Statement identifies the relevant planning policy context for the Proposed Development and considers the statutory development plan for the Site and relevant national and local planning guidance. It then appraises the merits of the development against this policy context to demonstrate how the Proposed Development accords with the statutory development plan and material considerations to the decision-making process.

5.2 Statutory Development Plan

5.2.1 Section 38(6) of the Planning and Compulsory Purchase Act 2004 (PCPA) requires applications to be determined in accordance with the Development Plan unless material considerations indicate otherwise.

5.2.2 As of the 1 April 2023, Cumberland Council is the Local Planning Authority (LPA) for the former administrative areas of Allerdale, Carlisle and Copeland. As set out in Local Government (Structural Changes) (General) (Amendment) Regulations 2018, if a Local Authority is going through Local Government Reorganisation, existing development plans will remain in place for the areas set out in the plan. Therefore, the existing development plans of the former LPAs will remain for the relevant geographical areas of Cumberland Council.

5.2.3 As such, the documents that comprise the statutory development plan in the context of this development at the time of writing are:

i) Local Plan Core Strategy and Development Management Policies;
ii) Local Plan Proposals Map and 2001-2016 Local Plan 'Saved' Policies; and
iii) Local Plan Interactive Proposals Map.

5.2.4 Whilst it is acknowledged that the Cumbria Minerals and Waste Local Plan 2015-2030 (CMWLP) also forms part of the development plan, this document is not specifically relevant to the Proposed Development has therefore not been considered any further.

The Adopted Copeland Local Plan 2013-2028

Core Strategy Policies

5.2.5 The Copeland Local Plan 2013-2028 (CLP) was adopted in December 2013, setting out an over-arching Vision, priority Objectives, development principles and a series of high-level spatial policies in order to deal with the strategic planning issues facing the Borough, alongside more detailed requirements for development proposals when considering planning applications. Along with an interactive Policies Map, which includes 'saved' policies from the 2001-2016 CLP, it remains current in the absence of any emerging development plan that has been suitably tested in public.

5.2.6 Included below is a summary of CLP policies considered to be of relevance to the Proposed Development.

5.2.7 **Policy ST1 – Strategic Development Principles** sets out the Strategic Development Principles that inform and underpin the Borough's planning policies and supports the development of energy infrastructure, related economic clusters, rural diversification, and tourism. In terms of renewable energy, seeks to encourage development that minimises carbon emissions, maximises energy efficiency and helps to adapt to the effects of climate change. It also seeks to protect and enhance areas, sites, species and features of biodiversity value, landscapes and the undeveloped coast, stating that "planning applications that accord with these principles and relevant Development Management policies, and do not undermine the Spatial Development Strategy, will be approved without unnecessary delay, unless material considerations indicate otherwise".

5.2.8 **Policy ST2 – Spatial Development Strategy** sets out how development should be distributed across the Borough and promotes growth in the local economy, particularly in the energy sector. It seeks to support renewable energy generating proposals which best maximise renewable resources, whilst minimising environmental and amenity impacts. In addition, it supports essential infrastructure required to facilitate energy development and other infrastructure that necessitates a location outside settlement limits.

5.2.9 **Policy ER2 – Planning for the Renewable Energy Sector** seeks to support new renewable energy generation proposals which best maximise renewable resources and minimise environmental and amenity impacts. It states that in determining

applications, the Council will have regard to targets agreed with partners, based on up-to-date research taking into account local circumstances.

5.2.10 **Policy ER3 – The Support Infrastructure for the Energy Coast** states that the Council will support energy sector development and other major infrastructure projects by working with operators and developers to ensure that any new energy transmission infrastructure minimises potential impacts on the Borough's landscape and natural environment, and on the health and amenity of its residents and visitors. It goes on to state that how applicants can demonstrate that the impacts of renewable energy developments are or can be made acceptable is defined within Policy DM2.

5.2.11 **Policy ENV1 – Flood Risk and Risk Management** seeks to ensure that development in the Borough is not prejudiced by flood risk by, amongst other things, ensuring that new development does not contribute to increased surface water run-off through measures such as Sustainable Drainage Systems, where these are practical. This policy is further supported by Policy DM24, by which individual development proposals will be assessed with regard to development and flood risk.

5.2.12 **Policy ENV3 – Biodiversity and Geodiversity** seeks to ensure that development incorporates measures to protect and enhance any biodiversity interest. Amongst other things, it also seeks to enhance, extend and restore priority habitats and look for opportunities to create new habitat, boost the biodiversity value of existing wildlife corridors and create new corridors, and stepping stones that connect them, in order to develop a functional Ecological Network. This policy is further supported by Policy DM25, which sets out a detailed approach towards managing development proposals that are likely to have an effect on nature conservation sites, habitats and protected species.

5.2.13 **Policy ENV4 – Heritage Assets** seeks to maximise the value of the Borough's heritage assets by, amongst other things, protecting listed buildings, conservation areas and other townscape and rural features considered to be of historic, archaeological or cultural value. This policy is further supported by Policy DM27, which sets out a detailed approach towards managing development proposals that are likely to have an effect on built heritage and archaeology.

5.2.14 **Policy ENV5 – Protecting and Enhancing the Borough's Landscapes** seeks to protect all landscapes from inappropriate change by ensuring that development does not threaten or detract from the distinctive characteristics of that particular area.

Development Management Policies

5.2.15 **Policy DM2 – Renewable Energy Development in the Borough** states that proposals for renewable energy development in the Borough will be supported where they satisfy the following criteria:

i) Proposals should be developed with the Borough's community and key stakeholders in accordance with the Council's current adopted approach to stakeholder involvement;
ii) There would be no unacceptable adverse visual effects;
iii) There would be no unacceptable adverse effects on landscape or townscape character and distinctiveness;
iv) There would be no unacceptable impacts on biodiversity or geodiversity;
v) The proposals would not cause an unacceptable harm to features of nature or heritage conservation importance;
vi) There are no unacceptable impacts of noise, odour, dust, fumes, light or other nuisance that is likely to affect residents and other adjoining land users;
vii) Any waste arising as a result of the development will be minimised and managed appropriately;
viii) Provision is made in proposals for the removal and site restoration at the end of the operating life of the installation.

5.2.16 It goes on to state that adequate mitigation measures would be secured to minimise the potential impacts of any renewable energy development proposals and to deliver significant benefits to the community where the scheme is to be sited wherever possible. If necessary, such measures would be secured through Planning Obligations.

5.2.17 **Policy DM24 – Development Proposals and Flood Risk** seeks to resist development that would result in an unacceptable risk of flooding or increase the risk of flooding elsewhere. The policy also requires the submission of a Flood Risk Assessment (FRA) where developments are likely to be at risk from flooding or increase risk of flooding elsewhere.

5.2.18 **Policy DM25 – Protecting Nature Conservation Sites, Habitats and Species** requires all development proposals to protect the biodiversity value of land and buildings. It states that development is expected to maximise opportunities for

conservation, restoration, enhancement and connection of natural habitats and creation of habitats for species listed in UK and Cumbria Biodiversity Action Plans, with special consideration given to those European habitats that lie outside the boundaries of European designated sites. The policy also states that where there is evidence to suspect the presence of protected species, any planning application should be accompanied by a survey assessing their presence and, if present, the proposal must be sensitive to, and make provision for, their needs. It goes onto state that all development proposals must take into account any likely significant effects on the internationally important sites both within the Borough and within a 20km radius of the Borough boundary, as well as those that are hydrologically linked to the development plan area.

5.2.19 **Policy DM26 – Landscaping** requires all development proposals to be assessed in terms of their potential impact on the landscape. It states that developers should refer to the Cumbria Landscape Character Assessment and Cumbria Historic Landscape Characterisation documents for the relevant character area and design their development to be congruent with that character.

5.2.20 **Policy DM27 – Built Heritage and Archaeology** supports development proposals which protect, conserve and where possible enhance the historic, cultural and architectural character of the Borough's historic sites and their settings. Conversely, it states that development proposals that have an adverse impact on heritage assets or their setting will not be supported. This policy is broadly consistent with Section 16 of the NPPF.

Copeland Local Plan 2001-2016 Saved Policies

5.2.21 There are no saved polices of relevance within this document and has therefore not been considered further.

Copeland Local plan 2013-2028 Proposals Map

5.2.22 As illustrated within Image 5.1, the Site is not located within any constraints of the proposals map.

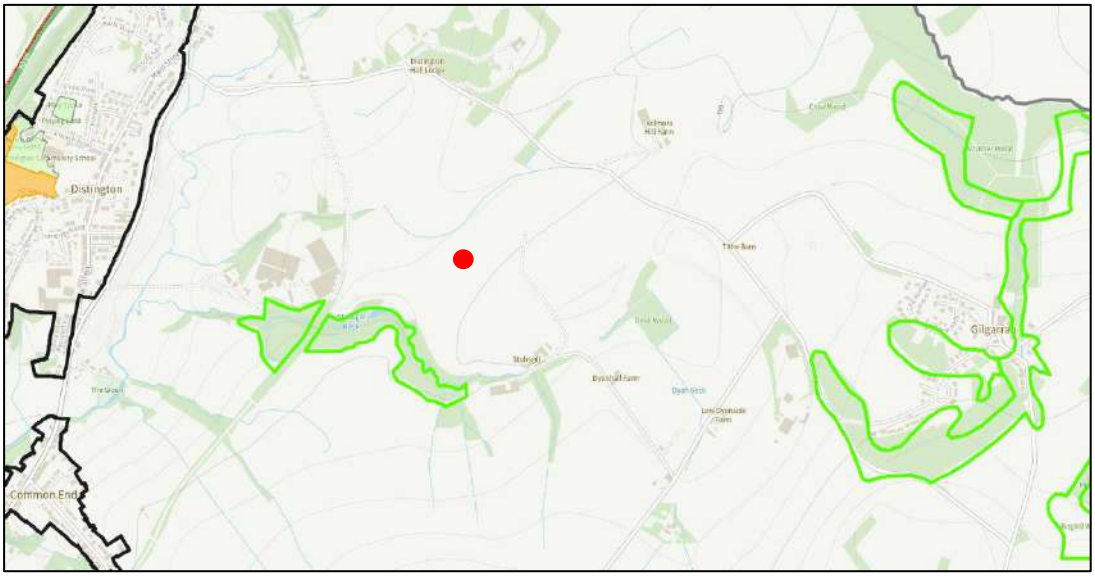

Image 5.1 – Copeland Local plan 2013 – 2021 Proposals Map

5.3 Material Considerations

5.3.1 There is no strict definition of what constitutes a 'material consideration' in planning legislation, although case law[6] indicates that any consideration, which relates to the use or development of land is capable of being a material consideration in the determination of planning applications.

5.3.2 In the case of this planning application, the key documents are considered to comprise the following:

i) National Planning Policy Framework (2024);
ii) National Planning Practice Guidance (PPG) (March 2014);
iii) Cumbria Wind Energy Supplementary Planning Document (2008); and
iv) The Emerging Copeland Local Plan 2021-2038.

5.3.3 Support provided in terms of the need for wind energy development is covered in Section 4.0 of this Planning Statement and is not repeated here. The material

[6] *DLA Delivery Ltd v Baroness Cumberlege of Newick [2018] EWCA Civ 1305 (8th June 2018)*

considerations section of this planning policy chapter provides coverage only of matters not specifically concerning need and which have not been addressed previously.

The National Planning Policy Framework (December 2023)

5.3.4 The NPPF was originally published in March 2012 but was recently updated in December 2023. The NPPF sets out the Government's planning policies and requirements for the planning system and comprises a material consideration of significant weight in the determination of planning applications.

5.3.5 At the core of the NPPF is the *"presumption in favour of sustainable development"* which is defined as *"meeting the needs of the present without compromising the ability of future generations to meet their own needs"*.

5.3.6 Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways. These are:

"a) ***an economic objective*** *– to help build a strong, responsive, and competitive economy, by ensuring that sufficient land of the right types in available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure.*

b) ***a social objective*** *– to support strong, vibrant, and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safely built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and*

c) ***an environmental objective*** *– to contribute to protecting and enhancing our natural, built, and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".*

5.3.7 For decision-making, this means:

"c) approving development proposals that accord with an up-to-date development plan without delay; or

d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting planning permission unless:

i. the application of policies in this Framework that protect areas of assets of particular importance provides a clear reason for refusing the development proposed; or

ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole".

5.3.8 The NPPF is divided into a number of chapters, some of which are considered to be of particular relevance to the Proposed Development. These are:

i) Chapter 4 – Decision-making;
ii) Chapter 11 – Making effective use of land;
iii) Chapter 14 – Meeting the challenge of climate change, flooding and coastal change; and
iv) Chapter 15 – Conserving and enhancing the natural environment.

5.3.9 The content of each above-identified chapter is considered briefly below.

Chapter 4 – Decision-making

5.3.10 Chapter 4, paragraph 38 of the NPPF required that Local Planning Authorities should:

"…approach decisions on proposed development in a positive and creative way. They should use the full range of planning tools available, including brownfield registers and permission in principle, and work proactively with applicants to secure developments that will improve the economic, social and environmental conditions of the area. Decision-makers at every level should seek to approve applications for sustainable development where possible".

Chapter 11 – Making Effective Use of Land

5.3.11 Chapter 11, paragraph 123 of the NPPF requires that:

"Decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring

safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously developed or 'brownfield' land".

Chapter 14 – Meeting the challenge of climate change, flooding and coastal change

5.3.12 Chapter 14, paragraphs 162 and 163 outlines what should be considered in the determination of applications for renewable energy proposals, stating:

"In determining planning applications, local planning authorities should expect new development to:

a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and

b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

When determining planning applications for renewable and low carbon development, local planning authorities should:

a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to significant cutting greenhouse gas emissions;

b) approve the application if its impacts are (or can be made) acceptable58. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas; and

c) in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site, and approve the proposal if its impacts are or can be made acceptable."

Chapter 15 – Conserving and Enhancing the Natural Environment

4.3.16 Finally, Chapter 15, paragraph 180 of the NPPF contains central government's

approach to ensuring that new developments contribute to and enhance the natural and local environmental by:

"a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan).

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate.

d) minimising impacts on and providing net gains for biodiversity, including establishing coherent ecological networks that are more resilient to current and future pressures.

e) preventing new and existing development from contributing to, being put an unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate".

5.3.13 Paragraph 163 of the NPPF states: *"When determining planning applications for renewable and low carbon development, local planning authorities should:*

- *not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to significant cutting greenhouse gas emissions;*
- *approve the application if its impacts are (or can be made) acceptable58. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas; and*

- *in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site, and approve the proposal if its impacts are or can be made acceptable."*

5.3.14 It is important to note that, as of 8 July 2024 footnotes 57 and 58 no longer applies to paragraph 163 effectively lifting the moratorium placed against on-shore wind developments in England.

National Planning Practice Guidance (March 2014)

5.3.15 The National planning Practice Guidance (PPG) adds further context to the NPPF, and it is intended that the two documents should be read together.

5.3.16 The PPG replaces over 7,000 pages of planning guidance that was previously published in separate documents. It is now entirely available in one place, in an online only format.

5.3.17 Plan makers must have regard to national policies and advice contained in the guidance when developing their plans. The guidance is also a 'material consideration' when taking decisions on planning applications. This means that if a local policy is deemed out of date, local authorities may be directed to the requirements set out in the PPG.

5.3.18 The PPG covers many topic areas of relevance in this instance. However, there are no matters of such import that might justify the inclusion in this policies analysis of information which is already contained within the policies of the statutory development plan, which is up-to-date, or the NPPF. However, one exception is where the PPG provides additional guidance on assessing the impact of a proposal on proposals for renewable and low carbon energy, which states in paragraph 013[7] that:

"The following questions should be considered when determining applications for wind turbines:

- *Do local people have the final say on wind farm applications?*

[7] *Reference ID: 5-013-20150327 - https://www.gov.uk/guidance/renewable-and-low-carbon-energy*

- *How are noise impacts of wind turbines assessed?*
- *Is safety an issue when wind turbine applications are assessed?*
- *Is interference with electromagnetic transmissions an issue for wind turbine applications?*
- *How can the risk of wind turbines be assessed for ecology?*
- *How should heritage be taken into account in assessing wind turbine applications?*
- *Is shadow flicker and reflected light an issue for wind turbine applications?*
- *How to assess the likely energy output of a wind turbine?*
- *How should cumulative landscape and visual impacts from wind turbines be assessed?*
- *What information is needed to assess cumulative landscape and visual impacts of wind turbines?*
- *Decommissioning wind turbines"*

5.3.19 All of these points have been addressed independently within section 6.0 of this Planning Statement.

Cumbria Wind Energy Supplementary Planning Document

5.3.20 The Cumbria Wind Energy Supplementary Planning Document (SPD) was produced in association with other Cumbrian local authorities and formally adopted in 2008. Whilst the wind energy and renewable energy policy in general has significantly changed since the adoption of the SPD, as it remains a stated material consideration for decision making in Copeland, the applicant has evaluated its contents to ensure compliance where appropriate. The SPD sets out key parameters that must be met to ensure that the wind energy development in Cumbria is appropriate stating:

"It is important that we look favourably on wind energy development that does not cause unacceptable harm to our built and natural environment. When preparing wind energy proposals a range of environmental, social and economic effects need to be considered. The guidance provides general advice on range of issues that must be dealt with for planning reasons. This includes aircraft and radar, biodiversity, cultural heritage, landscape and visual, local amenity, local economy, soils and hydrology and telecommunications."

5.3.21 These considerations have informed the planning assessment as set out within section 6.0 of this Planning Statement.

The Emerging Copeland Plan 2021-2038

5.3.22 Whilst work has begun on developing the Cumberland Local Plan, it is understood that the inherited development plans from former councils within Cumberland will be used to assess proposals. To this end, it is noted that, prior to the formation of the unitary authority, Copeland Borough Council were in the process of developing a new local development plan.

5.3.23 A review of Cumberland Council's Local Development Scheme 2024[8] (LDS) states: *"The advanced stage of the Copeland Local Plan at Vesting Day meant work has continued to complete and adopt the Copeland Local Plan 2021-2038 to ensure the Copeland area has up to date planning policies during the production of the Cumberland Local Plan"*.

5.3.24 Given the advanced stage of the Emerging Local Plan in addition to updates to the wind energy evidence base that has been used to inform the document, it is considered that weight should be given to the emerging policies within the Emerging Local Plan.

5.3.25 Paragraph 48 of the NPPF supports this conclusion stating: "*Local planning authorities may give weight to relevant policies in emerging plans according to:*

> *a) the stage of preparation of the emerging plan (the more advanced its preparation, the greater the weight that may be given);*
>
> *b) the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and*
>
> *c) the degree of consistency of the relevant policies in the emerging plan to this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given)".*

[8] https://www.cumberland.gov.uk/sites/default/files/2024-04/Cumberland%20LDS%20-%20accessible%20version%20-%2012.03.24%20%283%29.pdf

5.3.26 The policy of principle importance within the Emerging Local Plan is Policy CC2PU: Wind Energy Developments, which states (with our emphasis added):

"Large Turbines Wind turbines

50m in height or over must be located in an Area Suitable for Wind Energy as shown on the Local Plan Proposals Map, ***unless the proposal is for the repowering of existing turbines or windfarms or is for a proposal to extend the life of an existing turbine.***

All Turbines

The following impacts, caused by siting, scale or design, should be avoided where possible and should be considered individually and cumulatively: •

- *Landscape character including Historic landscape character*
- *Residential amenity*
- *Visual amenity and sensitive views – Biodiversity*
- *Geodiversity*
- *Flood risk*
- *Townscape*
- *Coastal change*
- *Heritage assets and their setting*
- *Highway safety*
- *Aviation and defence navigation systems/communication*
- *The amenities of sensitive neighbouring uses (including by virtue of noise, dust, odour, shadow flicker, air quality, traffic, visual impact or glare)*

Where proposals would result in significant adverse effects, proposals will only be accepted where this is outweighed by the wider environmental, economic, social and community benefits and in the case of the historic environment balanced against public benefit as per national policy. Where harm is unavoidable, the planning application must include details of mitigation measures proposed in order to overcome or reduce such harm.

Proposals will only be considered suitable where it can be demonstrated that the planning impacts identified by local communities during consultation have been fully addressed…

Proposals for the re-powering of turbines in areas which are identified as unsuitable in principle could potentially be permitted where the impacts of such development, including cumulative effect, are considered acceptable. *This will be assessed on a case by-case basis."*

5.3.27 The policy also states that: *"In contributing towards the achievement of renewable energy targets the Council has produced a study that identifies and assesses appropriate land to allocate as Areas Suitable for Wind Energy (Wind Energy Technical Study). Full consideration must be given to the Study prior to submitting proposals for wind turbines."*

Copeland Wind Energy Technical Study 2022

5.3.28 As per the requirements within Emerging Policy CC2PU. The Copeland Wind Energy Technical Study has been considered as part of this application. Aspects of the document pertaining to landscape character and suitability are considered within the supporting Landscape and Visual Impact assessment.

5.3.29 Figure 7 within the Copeland Wind Energy Technical Document provides a map of areas that would be suitable for wind energy development. This has been reproduced below in Image 5.2.

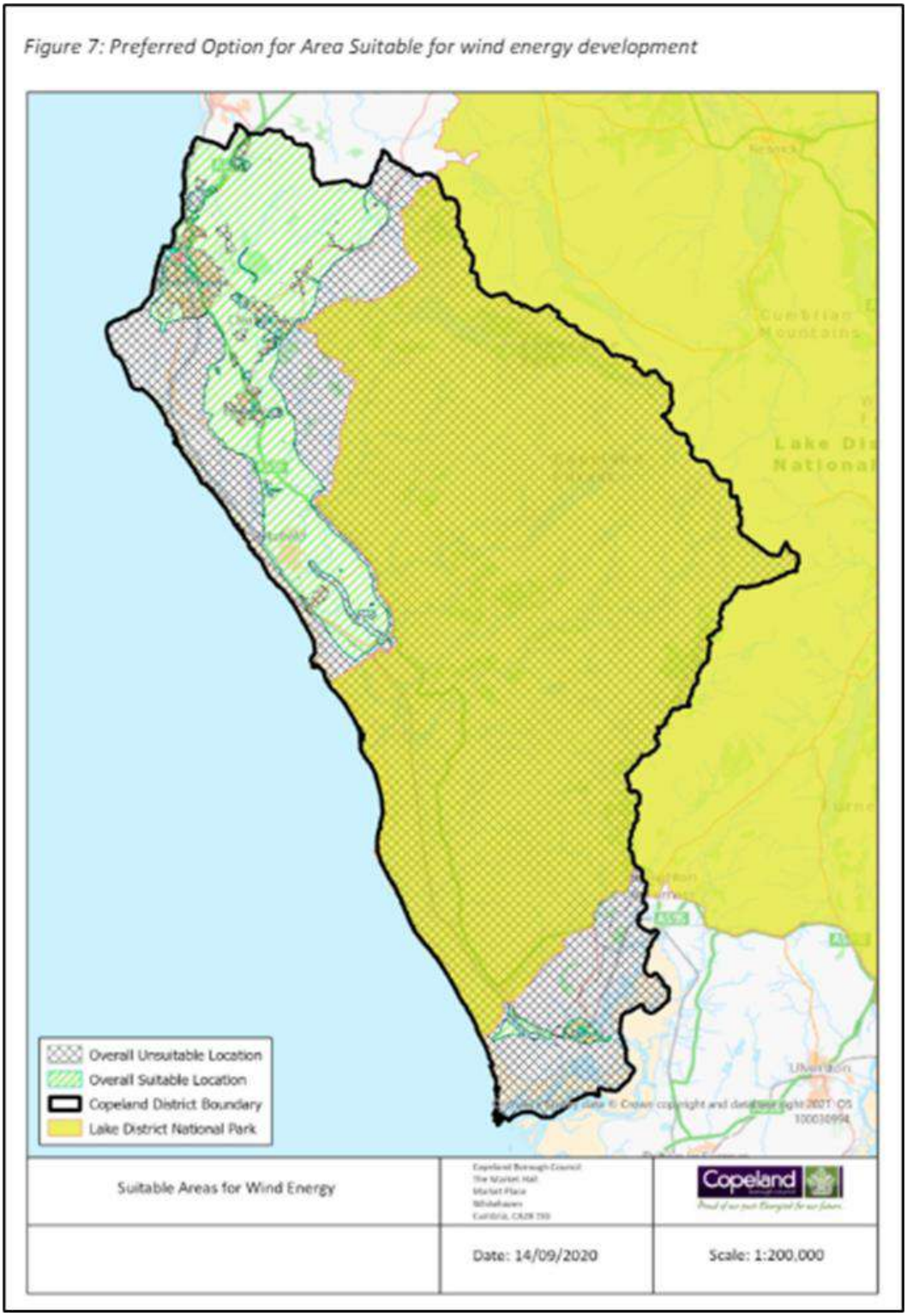

Image 5.2 – Figure 7 within the Emerging Copeland Local Plan

6.0 PLANNING ASSESSMENT

6.1 Introduction

6.1.1 This chapter of the Planning Statement undertakes an assessment of the Proposed Development against the planning policy context identified previously in Chapter 5.0. The appraisal has been undertaken against a range of environmental, social, and economic themes which have been informed by the guidance set out within Cumbria Wind Energy SPD, with the guidance (G#) then set out thereafter, namely:

i) Principle of Development
ii) Aircraft and Radar
iii) Biodiversity
iv) Community
v) Cultural Heritage
vi) Highways and Rights of Ways
vii) Landscape and Visual
viii) Local Amenity
ix) Local Economy
x) Soils and Hydrology
xi) Telecommunications
xii) Other Policy Considerations

6.1.2 This chapter provides a detailed assessment of the Proposed Development in the context of the above criteria, and in conjunction with other relevant planning policy and guidance. The purpose of this assessment is to demonstrate the overall compliance of the Proposed Development in the context of key planning policy considerations.

6.2 Principle of Development

6.2.1 The need for the development has been well established within Section 4.0. Paragraph 157 of the NPPF states that the planning system should "support renewable and low carbon energy and associated infrastructure". It later goes onto state that *"in the case of applications for the repowering and life-extension of existing*

renewable sites, give significant weight to the benefits of utilising an established site, and approve the proposal if its impacts are or can be made acceptable."[9]

6.2.2 The NPPF also notes that in *"In determining planning applications, local planning authorities should expect new development to comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable".* It is demonstrably clear through primary legislation that the repowering of sites and utilisation of existing sites is appropriate form of development subject to the impacts being acceptable and in accordance with the relevant authority's local plan. It should be noted that as of 8 July 2024 footnotes 59 & 60 of the NPPF have been removed, effectively lifting the moratorium placed against onshore wind. This removal shows a clear policy shift from central government in favour of wind energy development in England.

6.2.3 The most contemporary policies available within the Copeland Local Plan (CLP) to assess this metric are policy ER2 and Policy DM2, both set out the requirements for renewable energy generation within Copeland. Other policies, largely based on the location of development, have also been considered to this end.

6.2.4 Whilst supporting energy generation proposals that maximise renewable resources, Policy ER2 requires schemes to minimise environmental and amenity impacts, including those relating to visual effects, biodiversity, heritage conservation importance, emissions and other nuisance, as set out by Policy DM2. Similarly, Policy ENV2 seeks to support energy generating developments that require an undeveloped coastal location, provided that potential impacts on biodiversity, landscape and heritage assets are carefully assessed against its benefits. These aspects are assessed in further detail throughout the remainder of this Section of the report.

6.2.5 Further to this, the site is outside the defined settlement boundaries, where development will be restricted to that which has a proven requirement for such a location, including renewable energy generating proposals and associated essential infrastructure, in accordance with Policy ST2.

[9] *Paragraph 163 section c)*

6.2.6 G14 of the Cumbria Wind Energy SPD states *"Developers should confirm the acceptability of a specific site and the appropriate size and number of turbines through a preliminary analysis of technical, environmental and local amenity issues.".* It is considered that the utilisation of an existing site and singular turbine reflects the guidance of G14. The height of the replacement turbine is driven by Applicant's technical requirements to ensure the Site is viable.

6.2.7 As previously stated, the Emerging Local Plan is considered to be a key consideration in the determination of this application. Figure 7 in the Emerging Local Plan[10] indicates that the Site would be located in an area designated as being suitable for wind turbine development. Regardless, as the Proposed Development constitutes repowering, emerging policy CC2PU directly confers the acceptability of repowering large turbines subject to the impact on other factors being minimal, this is discussed further within this policy assessment. Overall, it can be considered that the Emerging Local Plan, supports the principle of development at this location.

6.2.8 The site is an operational wind turbine and is identified as a suitable location for wind farm development in the Cumbria Wind Energy SPD. The proposed development therefore complies with Policies ST2, ER2 and DM2 of the CLP. It is clear that, subject to ensuring compliance with the wider CLP, there is a clear principle for development of this type, at this location.

6.3 Aircraft and Radar

6.3.1 Guidance within the Cumbria Wind Energy SPD notes that wind energy developments may cause adverse impacts on aerodromes and air traffic control systems and instruments. G1 states that: *"Developers should enter into early dialogue with aviation stakeholders to identify any key issues that need to be addressed".*

6.3.2 PPG provides additional guidance on air traffic and safety stating: "*Wind turbines may have an adverse affect on air traffic movement and safety. Firstly, they may represent a risk of collision with low flying aircraft, and secondly, they may interfere with the proper operation of radar by limiting the capacity to handle air traffic, and aircraft instrument landing systems. There is a 15 kilometre (km) consultation zone*

[10] *See image 5.2*

and 30km or 32km advisory zone around every civilian air traffic radar, although objections can be raised to developments that lie beyond the 32km advisory zone. There is a c.15km statutory safeguarding consultation zone around Ministry of Defence aerodromes within which wind turbine proposals would be assessed for physical obstruction.".

6.3.3 The closest listed aerodrome to the Proposed Development is Walney aerodrome circa 55km south in Barrow-on-Furness. The Proposed Development is sited well outside the parameters listed within PPG paragraph 013.

6.3.4 Whilst the Applicant has not formally consulted with any of the key aviation stakeholders mentioned with the Cumbria Wind Energy SPD, the height increase would not exceed parameters set out by the Civil Aviation Authority[11], it is considered based on the Applicant's experience with other turbines of a similar height that there would be no risk to aircraft or radar, which will be confirmed during statutory consultation with stakeholders during determination.

6.4 Biodiversity

6.4.1 Guidance within the Cumbria Wind Energy SPD outlines the requirements to protect and conserve statutory and non-statutory designated sites in and around Cumbria noting that development should not negatively impact on any ecological assets. G2 states: *"Developers should assess the effects of potential schemes, alone or cumulatively, on biodiversity sites, habitats and species and identify measures to avoid or mitigate harm to them and secure their conservation and enhancement. Where a scheme, alone and in combination with other plans and projects, could have an impact on an internationally designated site, developers must carry out an assessment of the likely significant effect of the scheme in accordance with the Habitats Regulations".*

6.4.2 G3 relates to the development of wind turbines in relations to bats and states "*Developers should pay particular attention to assessing the effects of wind energy schemes, alone and cumulatively with other developments, on bats, birds and other*

[11] *CAP 764, 2016*

mobile species, both within and outside a site. Measure should be identified to avoid or mitigate harm to these species and secure their conservation and enhancement."

6.4.3 A Preliminary Ecological Appraisal (PEA) has been provided to support this application, the report has been prepared with reference to best practice guidelines for Ecological Impact Assessments in the UK and Ireland, as defined by CIEEM (2022) and is provided in accordance with the provisions of British Standard 42020:2013 Biodiversity: Code of practice for planning and development and BS 8683:2021 Process for Designing and Implementing Biodiversity Net Gain - Specification. The appraisal was informed by desk-based review of relevant ecological information and an extended habitat survey; and refers to relevant legislation, planning policy and guidance as appropriate.

6.4.4 The PEA considers the potential presence of rare, protected, or notable habitats and species, and the location of nearby features including designated sites for nature conservation. The Site does not form part of any statutory designated site for nature conservation, nor is it directly adjacent any statutory designated sites. Additionally, the Site does not include, nor is it adjacent to, any non-statutory designated sites. Nine non-statutory designated sites are situated within 2km of the Site boundary, the closest of which is the Beck Green Meadows CWS located approximately 960m west which contains priority habitat deciduous woodland.

6.4.5 The PEA found that the open habitats within the Site that would be impacted by the Proposed Development have low ecological value there is one habitat of Principle Importance (priority habitat), this being the native hedgerow which forms part of the field boundary. The primary impact to habitats on-site will be the permanent loss of an area of modified grassland through clearance, and the construction of new crane pads and associated infrastructure. The Proposed Development will not result in any direct or indirect effect on habitats of any statutory designated sites due to the separation distance between the Site and statutory designated sites and the small-scale nature of the works.

6.4.6 Removal of circa 10m of native hedgerow is required to facilitate site access, the size of such removals are not considered to be significant and would not materially alter the health of the habitat. All hedgerow removal would be as limited as possible as per the advice within the PEA.

6.4.7 With respect to birds, depending on the time of works there is a potential for breeding birds present on, or adjacent to, the site to be affected by construction activity through disturbance. It is unlikely that the operation of the Proposed Development would lead to any increased risk of displacement or collision mortality when compared to the existing turbine. In order to avoid disturbance during construction, suitable nesting habitat should be hand-searched by a suitably experienced ecologist prior to works commencing.

6.4.8 Regarding bats, there are no potential bat roosting habitats identified on-site with one PFR-FAR potential present adjacent to the Site boundary. It is considered that potential disturbance during the active season is unlikely. The modified grassland that is set to be lost is of negligible concern to bats or their prey with there also being more valuable bat habitats within the wider landscape. It is unlikely that bats would be affected by construction given they are not ground roosting, and similar to birds, there is unlikely to be any increased risk of collision mortality when compared to the existing turbine.

6.4.9 No invasive non-native species listed under Schedule 9 of The Wildlife & Countryside Act 1981 (as amended) or the EU Invasive Alien Species Regulation (1143/2014) were recorded onsite during the habitat surveys. If any such invasive species be encountered within or immediately surrounding the Site during construction, the advice of a suitably qualified ecologist would be sought and the appropriate measures taken to prevent the inadvertent introduction or spread of such plants.

6.4.10 The PEA illustrates that there would be an overall negligible impact, subject to a series of standardised mitigation measures, on ecological assets in the area during construction of the Proposed Development. Of all identified assets, the Proposed Development would not cause any adverse effects to the ecological standing of the application site or surrounding area and would conform to both national legislation and local policy.

6.4.11 The PEA outlines several standard measures to protect retained trees and hedgerows, ensure runoff control and pollution prevention will be implemented; these measures will safeguard habitats on and immediately surrounding the Site.

6.4.12 As per the enactments to the Environment Act 2021, the Proposed Development is required to provide 10% Biodiversity Net Gain (BNG). The DEFRA statutory metric tool has been used to assess the development.

6.4.13 The Proposed Development would result in a loss of 0.89 habitat units and 0.16 hedgerow units. The number of units required to reach 10% net gain post development are 1.16 habitat units and 0.19 hedgerow units.

6.4.14 Under the statutory framework for BNG, the biodiversity gain condition would be applied to any consent given for the Proposed Development. This condition would require a Biodiversity Gain Plan to be submitted to CC after planning permission has been granted, which would detail how a minimum of 10% BNG will be achieved for the Proposed Development, which would follow the Biodiversity Gain hierarchy.

6.4.15 In light of the above, the Proposed Development has considered the guidance set out within the Cumbrian Wind Energy SPD by providing an in-depth analysis of the extant and future ecological standing of the Site, noting that the development would cause negligible impact to existing ecological assets with acceptable mitigation measure implemented.

6.4.16 Further to this, when assessing the requirements as set out by Policy ENV3 of the CLP, it is clear that the Proposed Development has met the requirements as far as practicable within the remit of the repowering scheme. This has been achieved by ensuring that there are no adverse impacts on designated and non-designated assets and protected species, and satisfies criterions B, C, and E of Policy ENV 3.

6.5 Community

6.5.1 Guidance within the Cumbria Wind Energy SPD outlines the importance of wind energy generation for the local community in addition to the best practice approaches to undertaking pre-application exercises. G4 within the Cumbria Wind Energy SPD states: *"Developers should engage with the local community early in the design process to help identify issues that could help influence the overall design of a scheme".* G5 within the Cumbria Wind Energy SPD states *"The potential for community benefits should be explored with the local community and local planning authority."*

6.5.2 As evidenced within Section 1.4 of this Planning Statement, the Applicant has undertaken a brief consultation exercise that is commensurate with the scale of the Proposed Development. The comments received from the consultation exercise expanded the scope of the supporting landscape and visual assessment by providing

new viewpoint photographs as per the respondent's request. These viewpoints are evidenced within the supporting Landscape and Visual Impact Assessment.

6.5.3 With regard to community benefit, the Proposed Development comprises the repowering of an existing wind turbine (i.e., its replacement with a taller, more efficient model), utilising existing infrastructure such as the access road and turbine foundation pads. The proposed wind turbine would have a maximum generating capacity of 250kW. Whilst this figure is identical to the specification of the existing turbine, the Proposed Development is optimised to provide consistent energy generation at this level that the existing turbine cannot produce. Nonetheless, the Proposed Development is rated to meet the annual electricity needs of approximately 285 UK homes compared to the 146 UK homes that the current turbine provides for. Given the existing grid connections, the energy produced is likely to be utilised within the region providing immediate community benefit.

6.5.4 It is therefore clear that the Proposed Development conforms to the guidance as set out within the Cumbria Wind Energy SPD.

6.6 Cultural Heritage

6.6.1 G6 of the Cumbria Wind Energy SPD states *"An assessment of the effects of a proposal on international and national designations and their settings should be carried out. Negative effects should be reduced through appropriate mitigation."*

6.6.2 A review of online mapping tools indicate that there are no cultural heritage assets within the Site. A 5km buffer around the Site has been utilised to effectively assess the impacts of the Proposed Development on designated Scheduled Ancient Monuments (SAM), Grade I and Grade II* buildings and to ensure that there would not be a detrimental impact on their setting. The identified assets are as follows:

i) Parton Roman Fort (SAM);
ii) Hayes Castle (SAM);
iii) Defended enclosure at Salterbeck (SAM);
iv) Large irregular stone circle in and around cairn on Dean Moor (SAM);
v) Moresby Hall (Grade I);
vi) Rosehill, House and Adjoining Wall (Grade II*);
vii) Schoose Farmhouse and Adjoining Barn (Grade II*);

viii) Schoose Farm Windmill, Adjoining Barns, Gatehouse and Curtain Wall (Grade II*);
ix) Byres to the North of Schoose Farm House (Grade II*); and
x) Granary East of Schoose Farm House (Grade II*).

6.6.3 The Landscape and Visual Impact Assessment which has been submitted in support of this application is inclusive of a series of Zones of Theoretical Visibility (ZTV) Maps. The ZTVs have been produced in a theoretical worst case analysis of visibility of the Proposed Development as it is based on landform alone and not surface screening features.

6.6.4 Other than Rosehill, House and Adjoining Wall, the ZTV's have illustrated that the Proposed Development's 76m tip height would be visible to all identified heritage assets based on a bare earth model.

6.6.5 With this in mind, the Applicant, through the use of site visits and the interrogation of data mapping, has evaluated the impact that the Proposed Development would have on these assets.

6.6.6 For most of the identified assets, it is considered that the current built environment and existing vegetation in the form of several sections of mature and semi-mature trees sufficiently intercept the views and adequately screen the Proposed Development preventing heritage harm.

6.6.7 Those with comparatively less natural screening include the Parton Roman Fort (SAM) and Moresby Hall. These views have been assessed in this context, it is considered that the presence of existing tall infrastructure in the direction of the Proposed Development would ameliorate the Proposed Development into the existing skyline and prevent any visual harm.

6.6.8 It is therefore considered the Proposed Development fully accords with the requirements of Policies ENV4 and DM27 of the CLP. The assessment carried out is in full accordance with G6 of the Cumbria Wind Energy SPD.

6.7 Highways and Rights of Way

6.7.1 The Cumbria Wind Energy SPD details the need for all highways implications to be considered at first instance, with specific interest in access and ensuring that local road networks can accommodate turbine delivery. Any scheme would need to

illustrate its acceptability to the Highways Authority. G7 within the Cumbria Wind Energy SPD states *"A formal transport assessment should be carried out for the route to a site and its access. When determining any improvement measure consideration should be given to biodiversity and landscape and visual effects. The effect on all rights of ways and open access land should be considered and turbines should be sited at an appropriate distance from them".*

6.7.2 Whilst no formal transport assessment has been submitted in support of this application, details of turbine delivery, turbine routing and anticipated traffic have been provided within Section 4.0 of this Planning Statement. The information provided should provide adequate information to inform the local Highways Authority of the potential implications of the scheme.

6.7.3 With regard to Public Rights of Way (PRoW), the Proposed Development is not set to impede or alter any existing PRoWs in the immediate area as per the protections set out within The Countryside and Rights of Way Act 2000.

6.7.4 The Proposed Development requires a permanent new access track to the east as illustrated in Drawing 3369-091-SP-002, this is required to facilitate easier turbine delivery that does not unnecessarily impact on the wider road network. The proposed turbine access route is illustrated in Drawing 3369-091-TA-004.

6.7.5 It is considered that the information submitted should adequately address all policy requirements relating to Highways and Rights of Way.

6.8 Landscape and Visual Impact

6.8.1 Part 2 of the Cumbria Wind Energy SPD sets out guidance for assessing the landscape and visual effects of wind energy developments in the county. LG1 of the SPD states that *"Submission of a cumulative landscape and visual impact assessment will normally be necessary where new development is being proposed:*

a) Within an area already containing one or more operational or approved developments;
b) As an extension to an operational or approved development; and
c) At the same time as one or more other developments are being proposed through a planning application within an area The assessment area should be a minimum radius of 30km from the centre point of the new proposal and accompanied by a Cumulative ZVI(s) covering all developments within that radius."

6.8.2 Guidance on the cumulative effects of wind energy projects is outlined G12 and G13. G12 states that: *"The cumulative effects should be assessed for all relevant planning issues set out in section 2:*

- *Within an area already containing one or more operational or approved developments*
- *As an extension to an operational or approved development*
- *At the same time as one or more other developments are being proposed through a planning application within an area."*

6.8.3 G13 states that: *"The limiting threshold for cumulative effects and wind energy developments should be based on a well-considered judgement informed by analysis of:*

- *Degree or magnitude of change to an area, feature or species and the nature of the potential change reflecting the inherent sensitivity of the effected area, feature or species."*

6.8.4 Policy ENV 5 outlines that the landscapes in the borough are to be protected stating: *"The Borough's landscapes will be protected and enhanced by:*

a) Protecting all landscapes from inappropriate change by ensuring that development does not threaten or detract from the distinctive characteristics of that particular area;
b) Where the benefits of the development outweigh the potential harm, ensuring that the impact of the development on the landscape is minimised through adequate mitigation, preferably on-site;
c) Supporting proposals which enhance the value of the Borough's landscapes."

6.8.5 As the Proposed Development constitutes an extension to an approved wind turbine, the requirements to submit a cumulative landscape and visual assessment has been satisfied and as such a Landscape and Visual Impact Assessment has been included as part of the application.

6.8.6 Further guidance is provided within Part 2 of the Cumbria Wind Energy SPD that has been considered throughout the supporting LVIA.

6.8.7 The Proposed Development would comprise the repowering of the Stubsgill Farm wind turbine by replacing the existing turbine at the Site with a taller model. This would take place in a context where two lines of electricity pylons are prominent structures located close to the Site.

6.8.8 The Site is located within National Character Area 7: West Cumbria Coastal Plan with the Site being free of any national and local landscape designations. A full description of the Site's landscape characteristics is provided within section 4.4 of the supporting LVIA.

6.8.9 The conclusions of the LVIA show that the landscape and visual effects of the Proposed Development would be limited in scale and localised in extent. Beyond the immediately vicinity of the Site, effects would not be perceptibility different to those of the existing turbine. At short range there would be an incremental increase in the influence of wind turbines, but this influence is very well-established with longer distance views being ameliorated by existing tall infrastructure present in the current landscape.

6.8.10 Overall, the Proposed Development would accord with the landscape objectives identified by Copeland Borough Council in the *Wind Energy Technical Document, 2020*. The area within which the turbine is located is assessed as having moderate capacity for wind energy development of this scale. This capacity assessment considers sensitivity to development, landscape values and national designations.

6.8.11 Given the extensive size of the Proposed Development it is not considered that any landscaping scheme would appropriate and could appear overly incongruous with the current surround character.

6.8.12 The landscape and visual effects of the Proposed Development would not be significant. The Proposed Development would therefore be in accordance with Policies ER2, ENV3, criterions a and b of ENV5, DM2 and DM26 of the CLP in addition to the wider Cumbria Wind Energy SPD.

6.9 Local Amenity

6.9.1 The Cumbria Wind Energy SPD notes that noise and visual effects are the main planning related issued that need to be considered with regard to local amenity. The visual effects of the Proposed Development have already been thoroughly

considered throughout section 6.8 of this Planning Statement and the supporting LVIA.

6.9.2 G8 within the Cumbria Wind Energy SPD states: "*When determining the siting and design of turbines the proximity of noise sensitive developments must be considered along with appropriate mitigations to ensure that any turbine generated noise is at an acceptable level with other background noise. A noise assessment must be carried out to ensure that any turbine generated noise is at an acceptable level with other background noise".*

6.9.3 Furthermore, Criterion F within Policy DM2 of the CLP requires that *"there are no unacceptable impacts of noise, odour, dust, fumes, light or other nuisance that is likely to affect residents and other adjoining land users".* As such, a noise assessment, included in Appendix A, has been undertaken to assess impacts at nearby residential receptors.

6.9.4 Policy ER2 of the CLP states that the LPA will support the development of new renewable energy generation proposal that *"minimise environmental and amenity impacts".*

6.9.5 Criterion A within Policy ER3 requires developers to "*ensure that any new energy transmission infrastructure minimises potential impacts on the Borough's landscape and natural environment, and on the health and amenity of its residents and visitors".*

6.9.6 Given the age of the document and the development of wind energy policy since, the Applicant has recognised that shadow flicker from the turbine can also cause issue to local amenity.

6.9.7 As such, modelling has been undertaken to assess shadow flicker impacts at properties within a buffer of 10 times the rotor diameter of the Proposed Development, a comprehensive Shadow Flicker Assessment has been submitted to support this application and can be viewed in Appendix C.

6.9.8 Notably both assessments have been made in theoretical worst-case scenarios – the noise assessment assumes bare ground without object screening, while the shadow flicker also assumes bare ground and 0% cloud cover at all times.

6.9.9 The relevant summary findings of these modelling exercises are reported below in Table 6.1. The operational assessment of noise has been undertaken in accordance

with the recommendations of ETSU-R-97, which requires noise to be limited to an $L_{A90,10min}$ 35dB(A) at potential noise sensitive receptors, or 45dB(A) at properties with a financial interest in the proposals[12].

6.9.10 With regards to shadow flicker, the last update to the UK Shadow Flicker Guidance Evidence Base[13] stipulates that properties within 10 blade rotor diameters of a proposed turbine, within 130 degrees of due north, should be assessed for potential impacts. Whilst this update does not provide any acceptable levels of shadow flicker, best practice guidance from various countries suggests that a limit of 30 hours per year of year, or a maximum of 30 minutes per day on the worst affected day are appropriate thresholds.

Table 6.1 – Shadow flicker and noise modelling at residential properties

Property	Predicted Noise dB(A) ($LA_{90,10min}$)	Hours per year of Shadow Flicker	Maximum hours per day
Dyonhall Farm	37.0	0	0
Tithe Barn	34.5	0	0
Kelmore Hill Farm	37.1	0	0
Bergandal	38.1	0	0
Disington Hall Lodge	34.9	0	0

6.9.11 In terms of potential noise impacts, Appendix A illustrates that the noise levels at all receptors identified will be marginally greater than 35 dB $L_{A90,T}$ at 10 m/s wind speed (at 10 m AGL). As such, these levels are considered to be compared to background noise levels that are identified within published best practice guidelines and would not cause any substantial increase in noise comparative to the existing accepted wind turbine development at this location.

6.9.12 With respect to shadow flicker no shadow flicker is possible for any properties located within the defined search area, it is therefore clear that there would be no impact on local amenity arising from shadow flicker.

6.9.13 As per the requirements of Policy DM2, it is clearly evidenced that the Proposed Development would not cause unacceptable impacts to noise and nuisance that would affect residents and adjoining land users. By demonstrating that the Proposed

[12] *ETSU (September 1996) The Assessment and Rating of noise from Wind Farms*
[13] *DECC (2011) Update of UK Shadow Flicker Evidence Base*

Development has minimised environmental and amenity impacts it is clear that is accords with policy ER2 and criterion A within Policy ER3 of the CLP.

6.9.14 It is therefore clear that the Proposed Development accords with the requirements of Policies ST2, ER2, ER3 and DM26 of the CLP.

6.10 Local Economy

6.10.1 The Cumbria Wind Energy SPD notes that consideration should be given to the local economy when developing a wind energy scheme both during construction and when operational. G9 with the SPD states *"Developers should demonstrate the advantages and disadvantages for the local economy taking into account the local characteristics of the area and economy".*

6.10.2 Whilst not prescriptive to wind energy generation Section A of Policy ST1 states that: "*The Strategic Development Principles that inform and underpin the Borough's planning policies are:*

a) Economic and Social Sustainability
b) Support the development of energy infrastructure, related economic clusters, rural diversification and tourism in appropriate locations
c) Support diversity in jobs, and investment in education and training, especially that which creates and attracts business
d) Ensure development creates a residential offer which meets the needs and aspirations of the Borough's housing markets
e) Support development that provides or contributes to the Borough's social and community infrastructure enabling everyone to have good access to jobs, shops, services and recreational and sports facilities"

6.10.3 The Proposed Development, by virtue of the nature of the development, has limited exposure to enhancing the local economy. Cumbria currently equates 20% of economic activity to the tourist industry with steady growth of the last 5 years[14]. It has been demonstrated with section 6.8 of this Planning Statement that the height increase of the Proposed Development would not significantly alter the existing landscape of the surrounding area, any impact on the tourist industry would be

[14] https://www.thecumbrialep.co.uk/visitor-economy/#:~:text=Cumbria's%20visitor%20economy%20is%20hugely,over%2020%25%20of%20our%20economy.

negligible at best. that the Proposed Development would not significantly damage the tourist economy.

6.10.4 Furthermore, additional temporary employment opportunities would be facilitated during the construction phase should permission be granted, with the opportunity for local construction workers being explored prior to construction.

6.10.5 It is therefore clear that the Proposed Development would only provide a net benefit to the local economy and is in direct compliance with the Cumbria Wind Energy SPD and Section A of Policy ST1.

6.11 Soils and Hydrology

6.11.1 The Cumbria Wind Energy SPD outlines that developers should consider the effects of the scheme on soils, hydrology and water quality of a site and its surrounding water courses. G10 within the SPD states: *"Consideration should be given to effects on soils, hydrology and water quality in and around a site. Development should avoid harming soils, hydrology and water quality that would negatively affect habitats of principal importance for the conservation of biodiversity, or other protected species or habitats.".*

6.11.2 DM24 of the CLP outlines CC's approach to flood risk stating: *"Where a proposed development is likely to be at risk from flooding or increases risk of flooding elsewhere, a Flood Risk Assessment (FRA) will be required to be submitted as part of the planning application. Development will not be permitted where it is found that:*

a) *There is an unacceptable risk of flooding;*
b) *The development would increase the risk of flooding elsewhere;*
c) *The development would cause interference with or loss of access to a watercourse and the benefits of the development do not outweigh the risks of flooding.*
d) *Where a development requires the provision of additional flood defence and mitigation works, any costs, including maintenance, should be met by the developer."*

6.11.3 As evidenced within Section 3.0 of this Planning Statement, the Site is not at risk of any type of flooding and therefore this application has not been supported by a flood risk assessment.

6.11.4 The Site is not located within an area at risk from either river, coastal or surface water flooding. Furthermore, the Proposed Development would not constitute a level of new hardstanding that would lead to a material change in the levels of surface run-off.

6.11.5 As the Proposed Development constitutes the removal of an existing turbine, it is unlikely that there would be any adverse effects on soils that has not already been assessed as part of the current development.

6.11.6 It is therefore unlikely that the Proposed Development would have any impacts in terms of flood risk or drainage and as such is consistent with Policies ST1, ENV1 and DM24 of the CLP in addition to G10 of the Cumbria Wind Energy SPD.

6.12 Telecommunications

6.12.1 The Cumbria Wind Energy SPD requires developers to consider the implications of the development on the existing telecommunications apparatus. G11 of the Cumbria Wind Energy SPD states: *"Developers should contact OfCom at the outset of a project to determine any effects on telecommunications operators. This will assist with decisions on the final siting and design of a scheme and help identify any mitigation necessary".*

6.12.2 With regard to telecommunications, the current installation raised no objections during any phase of development, it is not envisioned that the Proposed Development would materially impact on telecommunications than the current installation.

6.12.3 It is considered based on the Applicant's experience with other turbines of a similar height that there would be no risk to telecommunications, which will be confirmed during statutory consultation with stakeholders during determination.

6.13 Other policy considerations

Construction, Decommissioning & Access

6.13.1 G17 of the Cumbria Wind Energy SPD provides guidance on the suitability of access tracks in relations to construction, operation and decommissioning stating: *"The effects of on-site access should be assessed throughout the lifetime of the development (construction, operation and decommissioning)."*

6.13.2 The Proposed Development requires a new access track to the east to facilitate access and remove unnecessary issues. The access track would be a permanent fixture to ensure ease during all phases of the Proposed Development, all specialist reports have been undertaken to reflect this and have confirmed its acceptability as part of the scheme.

6.13.3 The Proposed Development would have a short construction phase, which is likely to be in the order of six weeks, due to the existing infrastructure and access provided onsite. Turbine elements would be prefabricated before they arrive at the Site for assembly, meaning construction vehicle movements are limited and occur for a temporary period.

6.13.4 The largest turbine components are the rotor blades and the proposed access route for delivering these is shown on Planning Drawing 3369-091-TA-004.

6.13.5 It is envisaged that arrangements for decommissioning of the Proposed Development can be agreed via a suitable planning condition. This will ensure that appropriate provisions are put in place for the restoration of the Site at the end of the operational life of the Proposed Development.

6.13.6 It is therefore unlikely that any significant impacts would arise from the construction or decommissioning of the Proposed Development. As such, the proposal complies with Policies ST2 and ER2 of the CLP.

Climate change

6.13.7 A fundamental principle of the Proposed Development is that its contribution, along with many other repowered sites across the UK, will significantly contribute towards the decarbonisation of the UK energy industry. This is particularly important when the alternative is a future decommissioning of the existing turbine and a subsequent loss of generation capacity. This principle is fully supportive of paragraph 152 of the NPPF, which states that the planning system should “support the transition to a low carbon future… and support renewable and low carbon energy and associated infrastructure” and therefore gives significant weight to the climate crisis when considering development proposals.

6.13.8 The repowering of an existing turbine supports paragraph 152 of the NPPF with respect to climate mitigation and adaptation in two clear ways. Firstly, the use of an existing wind generation site allows existing infrastructure including access roads

and grid connections to be utilised, thus limiting development. Secondly, the reuse of parts removed from site within the wind turbine sector will help extend the operational life of similar turbines, thus reducing and evening out future demand of new turbines requiring primary materials.

Sustainable Development

6.13.9 Locating development correctly is fundamental to the objectives of the NPPF and the repowering of existing turbines fully supports its objectives in relation to the use of previously developed land, making sustainable use of the land. .

6.13.10 In this respect, the Proposed Development supports the objectives of the NPPF, *in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site.*

7.0 SUMMARY

7.1.1 This Planning Statement has been prepared by Axis, on behalf of the Applicant in support of a full planning application for the development of a repowered single wind turbine at Stubsgill Farm, Distington, Workington.

7.1.2 The changing nature of the UK's energy requirements is clearly defined by national planning policy, which clearly identifies an essential requirement for additional generation capacity to meet demand and support the transition to a low carbon, resilient energy network. The Proposed Development is afforded significant weight by utilising an existing wind turbine site, would clearly support the decarbonisation of the electricity generation using an efficient and larger turbine, and contribution towards meeting UK energy security of supply.

7.1.3 As identified in the preceding sections, the Proposed Development would not give rise to any material detrimental impacts in respect of aircraft and radar systems, biodiversity, community, cultural heritage, highways / PRoW, landscape and visual, local amenity, local economy, flood risk and telecommunications. Therefore balancing the benefits and significant weight afforded to the repowered turbine not leading to any significant harm or loss to the wider community or environment.

7.1.4 An assessment of the Proposed Development against relevant planning policy and guidance has demonstrated that the scheme accords with the relevant policies of the Development Plan. In addition, an assessment of relevant material considerations has not revealed any justification for determining the application other than in accordance with the Development Plan, rather it reinforces the logic for doing so.

7.1.5 In conclusion, and based on the findings of this Planning Statement, the significant weight afforded to renewable development and utilising an existing wind turbine site outweighs the minor impacts of a taller turbine, the granting of planning permission can be justified and the Proposed Development supported.

Appendix A – Noise Assessment

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PROPOSED REPLACEMENT WIND TURBINE AT STUBSGHILL FARM, CUMBRIA

NOISE IMPACT ASSESSMENT

Technical Report: R10415-1 Rev 0

Date: 2nd May 2024

For: Constantine Wind Energy Ltd
First Floor River Court
The Old Mill Office Park
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Surrey
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24 Acoustics Document Control Sheet

Project Title: Proposed Replacement Wind Turbine at Stubsghill Farm, Cumbria
Noise Impact Assessment

Report Ref: R10359-2 Rev 0

Date: 2nd May 2024

	Name	Position	Signature	Date
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For and on behalf of 24 Acoustics Ltd				

Document Status and Approval Schedule

Revision	Description	Prepared By	Checked by	Approved By
0	Approved for Issue	Reuben Peckham	David Coles	David Coles

DISCLAIMER

This report was completed by 24 Acoustics Ltd on the basis of a defined programme of work and terms and conditions agreed with the Client. The report has been prepared with all reasonable skill, care and diligence within the terms of the Contract with the Client and taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of manpower and resources allocated to the project.

24 Acoustics Ltd accepts no responsibility whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works.

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It should be noted that the assessment presented within this report is valid at the time that it was undertaken. Compliance with ETSU-R-97 is not indicative that complaints from some residents will not occur. Any party considering developing a wind turbine on the site at a later date should undertake their own due diligence to ensure that the site remains suitable (on noise grounds) for development.

EXECUTIVE SUMMARY

24 Acoustics Ltd has been instructed by Constantine Wind Energy Ltd to undertake an assessment of the noise impact of the operation of a single V52 wind turbine operating at Stubsghill Farm in Cumbria. It is proposed to decommission the existing wind turbine on the site and replace with this.

The assessment has been undertaken taking the background noise environment at the nearest noise-sensitive receptors to the proposed turbine into account and is based upon acoustic modelling of the noise emission from the turbine to predict operational noise levels at the receptor locations under a range of wind speeds.

The assessment has established that the noise emission from the proposed turbine will fall within the guidance stipulated in ETSU-R-97 at all locations and at all wind speeds.

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1.0 INTRODUCTION

1.1 24 Acoustics Ltd has been instructed by Constantine Wind Energy Ltd to undertake an assessment of the noise impact of the operation of a single V52 wind turbine operating at Stubsghill Farm in Cumbria. It is proposed to decommission the existing wind turbine on the site and replace with this.

1.2 The assessment has been undertaken taking the background noise environment at the nearest noise-sensitive receptors to the proposed turbine into account and is based upon acoustic modelling of the noise emission from the turbine to predict operational noise levels at the receptor locations under a range of wind speeds.

1.3 All sound pressure levels quoted in this report are in dB relative to 20 µPa. All sound power levels are quoted in dB relative to 10e-12 Watts. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION AND WIND TURBINE

2.1 Stubsghill Farm is situated close to the west coast of Cumbria, approximately 1.5 km south of Lilyyhall.

2.2 It is proposed to decommission the existing turbine and replace with a Vestas V52 wind turbine at OS co-ordinates 301883,523327.

2.3 The replacement turbine will have a hub height of 50 m and blade diameter of 54 m, giving a total tip height of approximately 77 m.

2.4 The nearest residential properties to the site are detailed as follows:

No	Name/ Address	OSGB36 Grid Reference	Approximate Distance from Turbine
1	Dyonhall Farm	302101,522937	445 m
4	Tithe Barn	302452,523284	560 m
5	Kelmore Hill Farm	302226,523609	460 m
6	Bergandal	301696,523684	410 m
7	Distington Hall Lodge	301565,523791	560 m

Table 1: Receptor Locations

2.5 Figure 1 provides an aerial image of the site, turbine and receptor locations.

3.0 ASSESSMENT CRITERIA AND CONSULTATION

3.1 For assessment of noise from turbines/wind farms in the UK, ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms' [Reference 1] is used. This document defines a framework for the measurement of noise from wind turbines and suggests noise limits for use in assessing the noise impact from wind turbines at the planning application stage of a project.

3.2 ETSU-R-97 requires the assessment of wind turbine noise to be assessed at night (between 23:00 and 07:00 hours) and during the 'quiet daytime hours' (evenings from 18:00- 23:00, Saturday afternoons between 13:00 and 18:00 and Sundays from 07:00 until 18:00). For the day-time period a noise limit of 35-40 dBA or 5 dBA above the prevailing background noise level is set (whichever is the greater). The distinction between the use of the absolute noise limit of 35 or 40 dBA is not explicitly stated, however, it relates to the number of receptor properties, the effect of the noise limit on the amount of electrical power generated and the duration of the level of exposure. At night the noise limit is 43 dBA or 5 dBA above the prevailing background noise level, whichever is greater.

3.3 Where the occupier of a property has some financial involvement with the wind turbine/ wind farm, the day and night-time lower noise limits are increased to 45 dB(A).

3.4 The noise limits apply across the turbine operational wind speeds (usually between 4 and 10 m/s) and it is necessary to quantify both the background noise level and the noise level emitted by the turbine(s) as a function of wind speed. The background noise level is measured simultaneously with wind speed (determined at a height of 10 m) and noise level is set by calculation of a best fit curve through values of background noise plotted against wind speed for both the quiet daytime and night-time operational periods.

3.5 Both the noise emitted from the turbine and the background noise levels are determined in terms of the overall A-weighted $L_{90,10\ min}$ sound pressure level. For wind turbine noise, the $L_{A90,10min}$ is considered to be 2 dB less than the $L_{Aeq,10min}$ over the same period.

3.6 ETSU-R-97 provides a simplified methodology for smaller or more remote schemes when the predicted noise level from the turbine does not exceed 35 dB L_{A90} at all wind speeds of up to 10 m/s. This can avoid the need to undertake background noise surveys when this scenario arises.

3.7 ETSU-R-97 also states that a penalty should be added to the predicted noise levels, where any tonal component is present. The level of this penalty is described and is related to the level by which any tonal components exceed audibility.

3.8 The noise limits in ETSU-R-97 take into account the fact that all wind turbines exhibit specific noise characteristics described as blade swish to a certain extent. Severe cases of blade swish can exhibit themselves as amplitude modulation. Some parties also have concern about infrasound and low frequency noise from wind farms.

3.9 There have been many planning appeals and public inquiries relating to proposed wind farm/ wind turbine sites. There have been a number of technical disputes between acoustic consultants working on behalf of the different parties. To minimise these disputes an agreement between these groups was published by the Institute of Acoustics in April 2009 [Reference 2] (known as the IOA Agreement).

3.10 In summary the IOA Agreement provides clarification of the following issues:

- The acquisition of baseline noise data at receptor locations and analysis of this data to take into account site- specific wind shear. Specifically, this states that to account for the effects of local wind shear, wind speeds should preferably be measured at two heights and then derived to a 10 m height (rather than measured, as stipulated in ETSU-R-97). When background noise surveys are carried out for sites where wind speeds can only be measured at 10 m height, then the noise assessment should take account of the wind shear variations using a method that should be explained. Where noise assessments are based solely on measured 10 m height wind speeds the noise limits in planning conditions should also refer to measured 10 m height wind speeds;

- The prediction of wind turbine noise at receptor locations- stating that the propagation methodology of ISO 9613 [Reference 3] be used with a ground effects condition of G=0.5 used with a 4 m receptor height and the turbine vendor's sound power level data, together with the effect of acoustic barriers, ensuring that no account should be taken of barrier attenuation caused by a landform unless there is no line-of-sight between the receptor and the highest point of the turbine rotor (in which case a barrier correction of 2 dB(A) can be justified);

- Vibration and low frequency noise. It is concluded that there is no robust evidence that low frequency noise (including noise and ground-borne vibration) from wind farms, generally has adverse effects on wind farm neighbours.

IOA Good Practice Guide

3.11 The Institute of Acoustics published a '*Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'* [Reference 4] in May 2013. This document provides some useful guidance on best practice for the modelling of wind turbine noise, measurement of background noise levels, and analysis of data, such as:

- The use of regression lines for background noise data;
- Removal of samples immediately before and after rainfall;
- Removal of elevated background noise levels due to the dawn chorus;
- Applying a wind shear correction to predicted turbine noise levels where a 10 metre met mast has been used during the background noise survey.

3.12 Where practicable, the guidance contained in the Good Practice Guide has been followed in this assessment.

4.0 BACKGROUND AND WIND SPEED SURVEYS NOISE LEVELS

4.1 Background noise surveys were carried out between 20th March and 16th April 2024 in accordance with the requirements of ETSU-R-97 at the receptor locations representative of residential properties most likely to be affected by noise from the proposed wind turbine, as shown in Figure 1 and described below:

- Location 1: Dyonhall Farm (at OS coordinates 302083,522891);
- Location 2: Kelmore Hill Farm (at OS coordinates 302225,523615).

4.2 Photographs showing the survey locations are displayed in Figure 3.

4.3 The noise surveys were undertaken using the following instrumentation:

- 2 x Rion NL-32 precision grade class 1 accuracy sound level meter;
- Brüel and Kjær Type 4231 acoustic calibrator.

4.4 The instrumentation was calibrated before and after the surveys in accordance with the manufacturers' instructions. No drift in calibration was recorded. The calibration certificates of the instrumentation used are provided in Appendix B.

4.5 The sound level meters were installed at a height of approximately 1.5 m above local grade level. Dual-layer Rion WS03 environmental windshields were fitted to the microphones. Measurements were undertaken in samples of ten minutes in terms of the $L_{A90,\ 10\ min}$ sound pressure level.

4.6 A 10 m mast was installed at a location representative of the proposed turbine location at Waunfawr (at OS coordinates 301865,523247) and a NRG #40C calibrated anemometer installed at the apex. The mast and associated instruments were used to log wind speed, wind direction, precipitation and air temperature throughout the survey period.

4.7 The results of the surveys for the quiet daytime and night-time periods (as defined in ETSU-R-97) are detailed below.

Wind Speed m/s (10 m AGL) and Background Noise Level, dB L_{A90}						
4	**5**	**6**	**7**	**8**	**9**	**10**
30.5	31.6	33.1	35.0	37.1	39.5	42.1

Table 3: Quiet Daytime Background Noise Levels, Location 1, Dyonhall Farm

Wind Speed m/s (10 m AGL) and Background Noise Level, dB L_{A90}						
4	**5**	**6**	**7**	**8**	**9**	**10**
28.6	30.1	31.9	34.0	36.2	38.6	40.9

Table 4: Night-time Background Noise Levels, Location 1, Dyonhall Farm

Wind Speed m/s (10 m AGL) and Background Noise Level, dB L_{A90}						
4	**5**	**6**	**7**	**8**	**9**	**10**
30.7	31.2	32.3	34.1	36.5	39.6	43.2

Table 5: Quiet Daytime Background Noise Levels, Location 2, Kellmore Hill Farm

Wind Speed m/s (10 m AGL) and Background Noise Level, dB L_{A90}						
4	**5**	**6**	**7**	**8**	**9**	**10**
27.3	29.3	31.3	33.5	35.6	37.8	39.9

Table 6: Night-time Background Noise Levels, Location 2, Kellmore Hill Farm

5.0 WIND TURBINE NOISE PREDICTIONS

5.1 It is proposed to replace the existing turbine with a single Vestas V52 wind turbine. This has a rated power output of 850 kW.

5.2 The turbine source sound power level has been taken from the Vestas V52 noise test report (reproduced in Appendix C) and is summarised in Tables 7 and 8 below.

	Standardised 10 m Wind Speed, m/s						
	4	**5**	**6**	**7**	**8**	**9**	**10**
Apparent Sound Power Level, $L_{WA,k}$ (dB)	91.3	96.5	98.5	99.2	99.9	100.7	101.3
ETSU-R-97 Tonal Correction (dB)	0	0	0	0	0	0	0
IOA GPG Uncertainty (dB)	2	2	2	2	2	2	2
Effective sound power level, L_{WA} (dB)	93.3	98.5	100.5	101.2	101.9	102.7	103.3

Table 7: V52 Sound Power Levels, 100 dB mode

Octave Band Sound Power Level, dBA Octave Band Centre Frequency, Hz							
63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
82.9	89.3	95	97.1	97	95.3	89.8	76.2

Table 8: Sound Power Level Frequency Spectrum for Standardised 10 m Wind Speed of 10 m/s, V52, 100 dB mode

5.3 The manufacturer's report states that no tones with a tonal audibility greater than 2 dBA can be expected from this turbine, and therefore no tonal penalty has been applied to the sound power level.

5.4 Predictions of the noise emission from the wind turbine have been carried out using IMMI noise mapping software. The propagation methodology of ISO 9613 [Reference 3] has been used which takes into account the effects of geometric divergence, acoustic screening and atmospheric and ground absorption.

5.5 The calculations have assumed an ambient temperature of 10 °C and relative humidity of 70%. Downwind propagation conditions have been assumed throughout. The calculations have determined the noise level from the turbine at a receptor height of 4 m above local grade level and have assumed a ground absorption factor of G=0.5 (which complies with current agreed understanding).

5.6 At this site no account has been taken of any acoustic shielding that may be provided by the natural topography of the land. The calculations therefore represent a worst-case assessment.

5.7 The results of the acoustic model are provided graphically in Figure 2 as a noise contour map (assuming the maximum noise output that is experienced at a 10 m height wind speed of 10 m/s and described below in Table 7. The turbine noise levels have been corrected from L_{Aeq} sound pressure levels to L_{A90} sound pressure levels by subtracting 2 dBA in accordance with the ETSU-R-97 methodology.

Receptor		Predicted Wind Turbine Sound Pressure Level, dB L_{A90}
No.	**Name/ Address**	
1	Dyonhall Farm	37.0
4	Tithe Barn	34.5
5	Kelmore Hill Farm	37.1
6	Bergandal	38.1
7	Distington Hall Lodge	34.9

Table 7: Results of Noise Propagation Calculations, 10 m Height Wind, 10 m/s wind speed.

6.0 NOISE IMPACT ASSESSMENT

6.1 The calculations indicate that the noise level at all receptors identified will be marginally greater than 35 dB $L_{A90,T}$ at 10 m/s wind speed (at 10 m AGL). As a result, the noise levels at these properties have been compared to the background noise levels described above in accordance with the ETSU-R-97 methodology for both the quiet daytime and for the night-time periods. Figures 4 to 7 show the measured background noise levels, the derived ETSU-R-97 noise limits and the noise level predicted from the turbine for both the quiet daytime and night-time periods. The corresponding data is provided in tabular format in Appendix D.

6.2 The analysis indicates that the predicted noise levels from the turbine will be lower than the ETSU-R-97 noise limits for both the quiet daytime and night-time periods at all receptors at all wind speeds.

7.0 CONCLUSIONS

7.1 24 Acoustics Ltd has been instructed by Constantine Wind Energy Ltd to undertake an assessment of the noise impact of the operation of a single V52 wind turbine operating at Stubsghill Farm in Cumbria. It is proposed to decommission the existing wind turbine on the site and replace with this.

7.2 The assessment has been undertaken taking the background noise environment at the nearest noise-sensitive receptors to the proposed turbine into account and is based upon acoustic modelling of the noise emission from the turbine to predict operational noise levels at the receptor locations under a range of wind speeds.

7.3 The assessment has established that the noise emission from the proposed turbine will fall within the guidance stipulated in ETSU-R-97 at all locations and at all wind speeds.

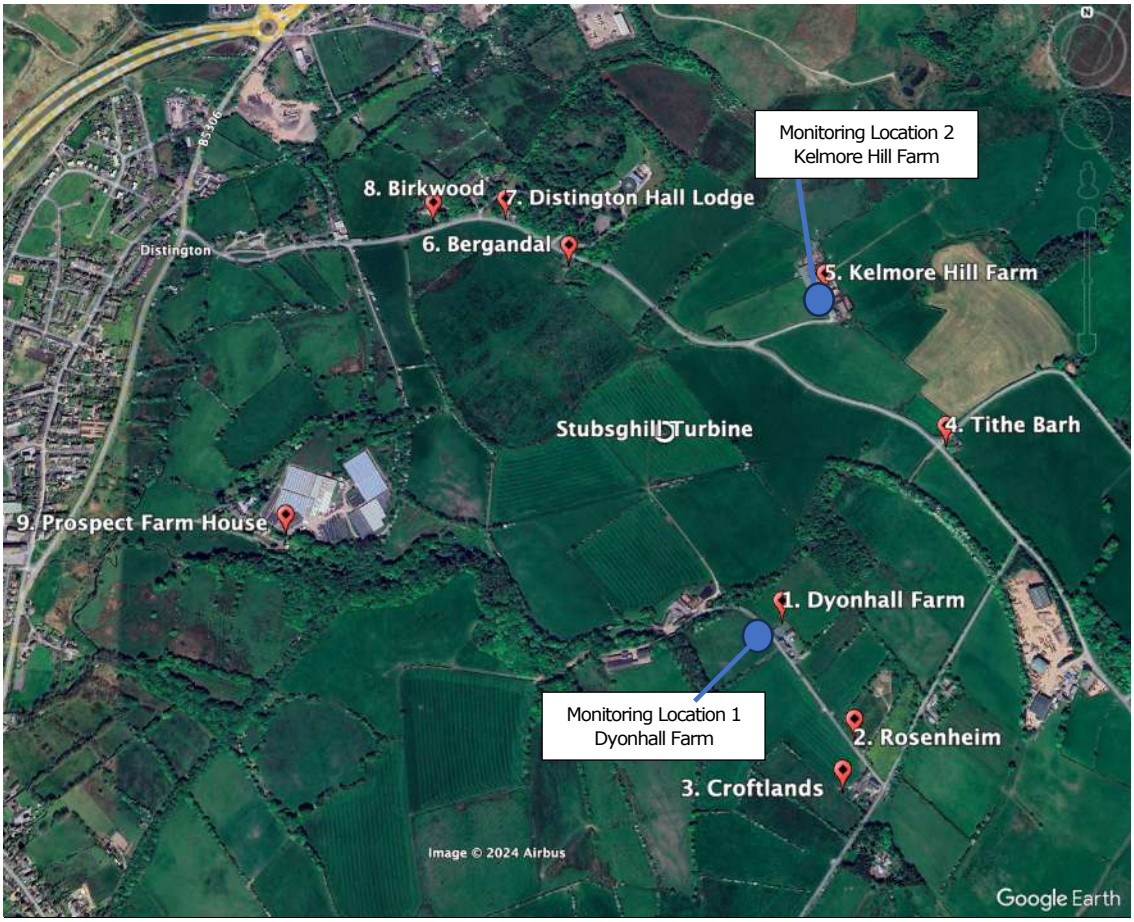
REFERENCES

1. ETSU-R-97, Assessment and Rating of Noise from Wind Farms, Department of Trade and Industry, 1997.

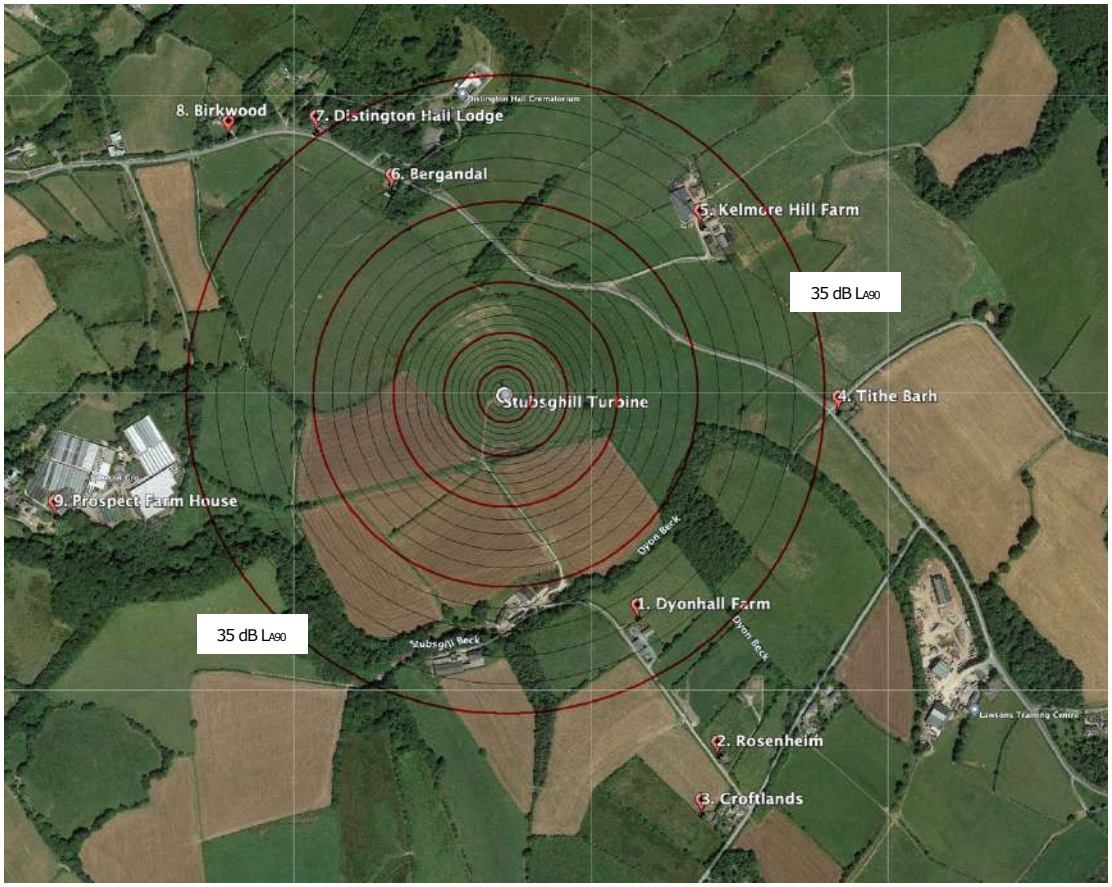
2. Prediction and Assessment of Wind Turbine Noise, Institute of Acoustics, Acoustics Bulletin March, April 2009.

3. ISO 9613, Acoustics- Attenuation of Sound During Propagation Outdoors, International Standards Organisation, 1993.

4. 'A Good Practice Guide to the Application of ETSU-R-97 For The Assessment And Rating Of Wind Turbine Noise', Institute of Acoustics, May 2013.



Project: Stubsghill Farm	**Title:** Turbine, Receptor & Background Noise Survey Locations	
DWG No: Figure 1	**Scale:** N.T.S.	**Rev:** -
Date: May 2024	**Drawn By:** RP	**Job No:** 10415



Project: Stubsghill Farm	**Title:** Site Noise Contours- 10 m/s @ 10 m AGL		
DWG No: Figure 2	**Scale:** N.T.S.	**Rev:** -	
Date: May 2024	**Drawn By:** RP	**Job No:** 10415	

Noise Monitor, Location 1, Dyonhall Farm

Noise Monitor, Location 2, Kelmore Hill Farm

Project: Stubsghill Farm Farm	**Title:** Photographs of Noise Monitor Location	
DWG No: Figure 3	**Scale:** N.T.S.	**Rev:** -
Date: April 2024	**Drawn By:** RP	**Job No:** 10415

Figure 4: ETSU-R-97 Noise Impact Assessment - Dyonhall Farm, Quiet daytime

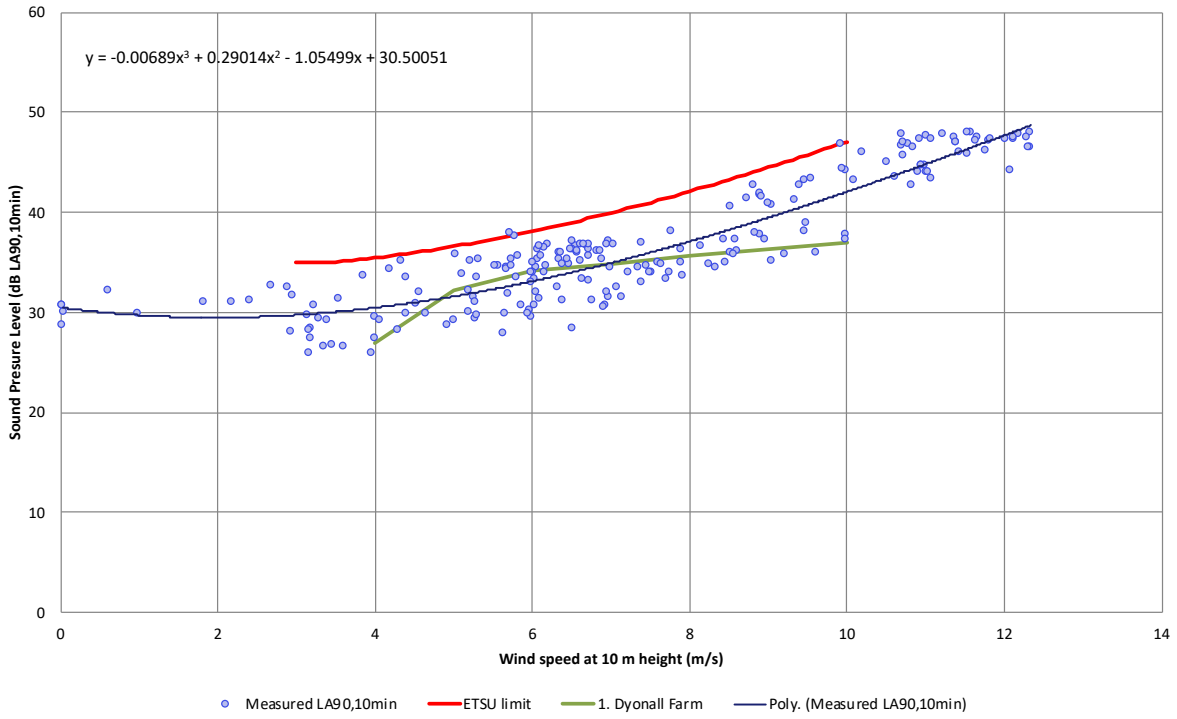


Figure 5: ETSU-R-97 Noise Impact Assessment - Dyonhall Farm, Night-time

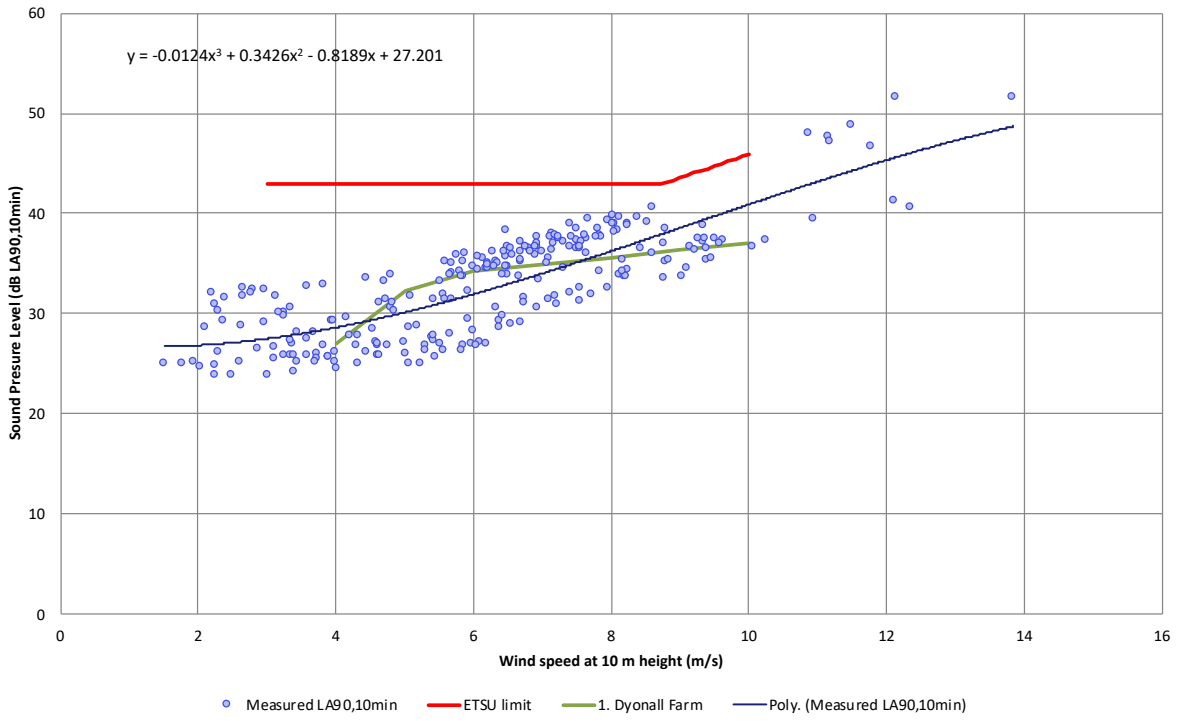


Figure 6: ETSU-R-97 Noise Impact Assessment, Kelmore Hill Farm - Quiet daytime

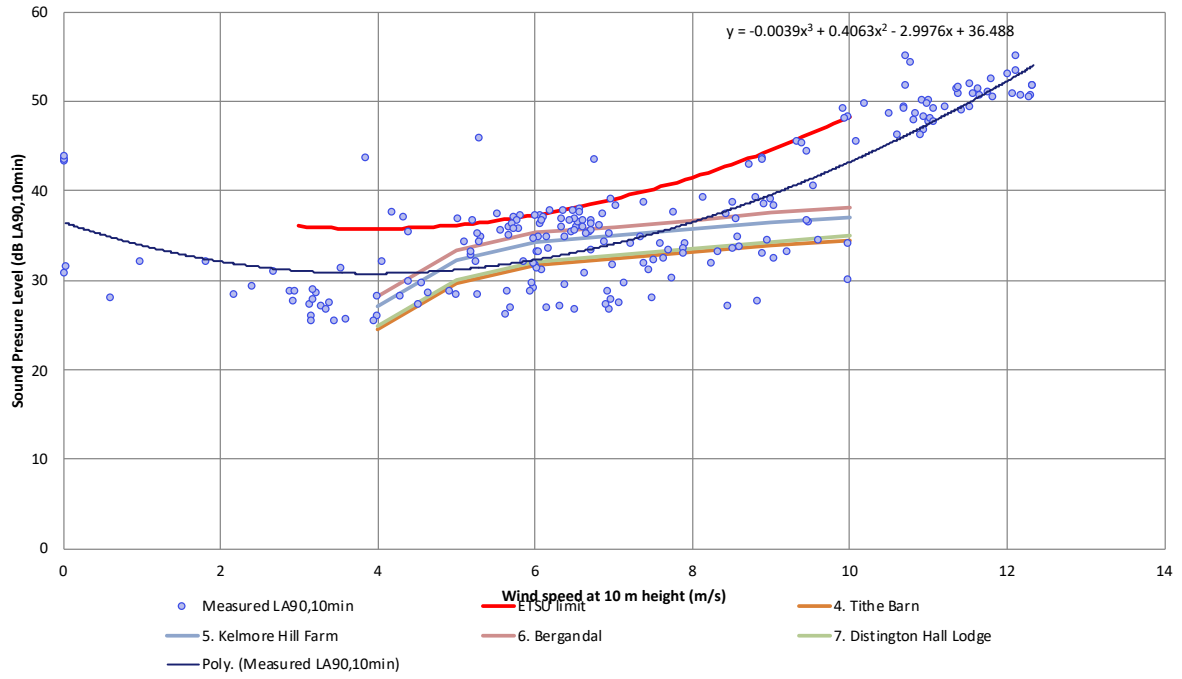
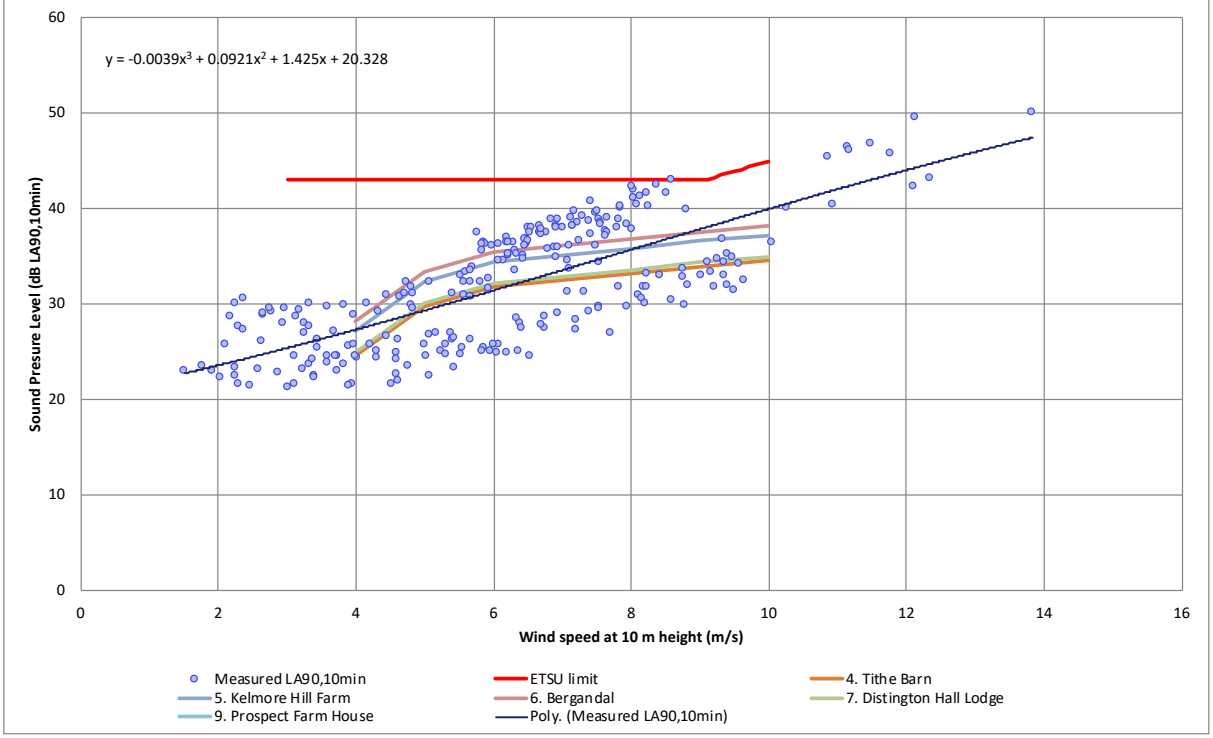


Figure 7: ETSU-R-97 Noise Impact Assessment, Kelmore Hill Farm - Night-time



APPENDIX A – ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 [1] as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time internal, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – INSTRUMENTATION CALIBRATION CERTIFICATES

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
+44 (0)23 8155 5020 hello@nvcal.co.uk

NVCal
NOISE & VIBRATION CALIBRATION SERVICES

IEC 61672-3:2006 Calibration

Procedures from IEC 61672-3:2006 were used to perform the periodic tests on **2nd December 2022** for the following sound level meter:

Rion NL-32, serial number 00151044

The following tests were undertaken:

Acoustical signal tests of a frequency weighting	**PASS**
Electrical signal tests of frequency weightings	**PASS**
Frequency and time weightings at 1 kHz	**PASS**
Long-term stability	**PASS**
Level linearity on the reference level range	**PASS**
Level linearity including the level range control	**PASS**
Toneburst response	**PASS**
Peak C sound level	**PASS**
Overload indication	**PASS**

Calibration result

Sound level meter: Rion NL-32, serial 00151044
Performance Specification: IEC 61672-3:2006 Class 1
Date: 2nd December 2022
Certificate Number: C00412

PASS

Approved Signatory: … ……

Notes

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
+44 (0)23 8155 5020 hello@nvcal.co.uk

IEC 61672-3:2006 Calibration

Procedures from IEC 61672-3:2006 were used to perform the periodic tests on **25th November 2022** for the following sound level meter:

Rion NL-32, serial number 00530383

The following tests were undertaken:

Acoustical signal tests of a frequency weighting	**PASS**
Electrical signal tests of frequency weightings	**PASS**
Frequency and time weightings at 1 kHz	**PASS**
Long-term stability	**PASS**
Level linearity on the reference level range	**PASS**
Level linearity including the level range control	**PASS**
Toneburst response	**PASS**
Peak C sound level	**PASS**
Overload indication	**PASS**

Calibration result

Sound level meter: Rion NL-32, serial 00530383
Performance Specification: IEC 61672-3:2006 Class 1
Date: 25th November 2022
Certificate Number: C00410

PASS

Approved Signatory: .....

Notes

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
+44 (0)23 8155 5020 hello@nvcal.co.uk

IEC 60942:2003 Calibration

Periodic tests were performed in accordance with procedures from Annex B of IEC 60942:2003 (using the Insert Voltage Technique) on **3rd May 2023** for the following sound calibrator:

Brüel & Kjær 4231, serial number 2432098

Calibration result

Sound Calibrator: Brüel & Kjær 4231, serial 2432098
Performance Specification: IEC 60942:2003 Class 1
Date: 3rd May 2023
Certificate Number: C00433

PASS

Approved Signatory: ....

Test results

Level		**94.00**	**dB** re 20 µPa	+/- 0.091 dB
		114.05	**dB** re 20 µPa	+/- 0.091 dB
Frequency	@ 94 dB	**999.988**	**Hz**	+/- 0.01 Hz
	@ 114 dB	**999.988**	**Hz**	+/- 0.01 Hz
Distortion	@ 94 dB	**0.55**	**%**	+/- 0.021 %
	@ 114 dB	**0.18**	**%**	+/- 0.012 %

Notes

As public evidence was available, from a testing organisation (PTB) responsible for approving the result of pattern evaluation tests, to demonstrate that the model of sound calibrator fully confirmed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to confirm to all the class 1 requirements of IEC 60942:2003.

This certificate provides traceability of measurement to the SI system of units and to units of measurements realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

APPENDIX C – VESTAS V52 Noise SOURCE REPORT

Schallleistungspegel /
Acoustic Noise Level
V52-850 kW
OptiSpeed™-Windenergieanlage

Rev. 5
2007-07-23

1.5. Betriebsmode 100 dB(A)

1.5.1. Verifizierende Richtlinie: IEC 61400-11

1.5. Mode 100 dB(A)

1.5.1. Verification Standard: IEC 61400-11

Schallleistungspegel in Nabehöhe ,V52-850kW, Betriebsmode 100 dB(A) ***Sound Power Level at Hub Height, V52-850kW, Mode 100 dB(A)***										
Umgebungsbedingungen / ***ambient conditions:***	Windscherung wie in der Tabelle unten beschrieben / *Wind shear as described in table below.*									
	Maximale Turbulenz in 10 m Höhe ü.G. / *Max turbulence at 10 meter height:* 0.16									
	Vertikaler Antrömwinkel / Inflow angle (vertical): 0 ± 2°									
	Luftdichte / *Air density:* 1.225 kg/m3									
Allgemeine Bedingungen/ ***General conditions:***	Verifizierende Richtlinie / *verification standard:* IEC 61400-11 Ed. 2									
	Genauigkeit / *Accuracy:* ± 2dB(A)									
Nabenhöhe / ***Hub height*** **[m]**	**36.5**	**40**	**44**	**49**	**55**	**60**	**65**	**70**	**74**	**86**
Windscherung / *Wind shear*	0.16									
	[dB(A) re 1pW]									
L_{WA} @ 4m/s (10 m. ü. G.) / L_{WA} @ 4m/s (10 m. a. g. l)	89.8	90.0	90.3	90.7	91.1	91.3	91.6	91.8	92.0	92.5
L_{WA} @ 5m/s (10 m. ü. G.) / L_{WA} @ 5m/s (10 m. a. g. l)	94.8	95.1	95.4	95.8	96.2	96.5	96.7	97.0	97.1	97.6
L_{WA} @ 6m/s (10 m. ü. G.) / L_{WA} @ 6m/s (10 m. a. g. l)	98.0	98.1	98.2	98.3	98.4	98.5	98.5	98.6	98.6	98.7
L_{WA} @ 7m/s (10 m. ü. G.) / L_{WA} @ 7m/s (10 m. a. g. l)	98.9	98.9	99.0	99.1	99.2	99.2	99.3	99.3	99.4	99.5
L_{WA} @ 8m/s (10 m. ü. G.) / L_{WA} @ 8m/s (10 m. a. g. l)	99.6	99.6	99.7	99.8	99.9	99.9	100.1	100.1	100.1	100.4
L_{WA} @ 9m/s (10 m. ü. G.) / L_{WA} @ 9m/s (10 m. a. g. l)	100.2	100.3	100.4	100.5	100.6	100.7	100.7	100.8	100.8	101.0
L_{WA} @ 10m/s (10 m. ü. G.) / L_{WA} @ 10m/s (10 m. a. g. l)	100.8	100.9	101.2	101.2	101.2	101.3	101.4	101.5	101.6	101.7

m. ü. G.: Meter über Grund
m. a. g .l: meter above ground level

1.5.2. Verifizierende Richtlinie: FGW

1.5.2. Verification Standard: FGW

Schallleistungspegel in Nabehöhe ,V52-850kW, Betriebsmode 100 dB(A) ***Sound Power Level at Hub Height, V52-850kW, Mode 100 dB(A)***										
Umgebungsbedingungen / ***ambient condition:***	Windscherung wie in der Tabelle unten beschrieben / *Wind shear as described in table below.*									
	Maximale Turbulenz in 10 m Höhe ü.G. / *Max turbulence at 10 meter height:* 0.16									
	Vertikaler Anströmwinkel / Inflow angle (vertical): 0 ± 2°									
	Luftdichte / *Air density:* 1.225 kg/m3									
Allgemeine Bedingungen/ ***General conditions:***	Verifizierende Richtlinie / *verification standard:* FGW Teil 1, Rev. 17 FGW part 1, Rev. 17									
	Genauigkeit / *Accuracy:* +/- 2dB(A)									
Nabenhöhe / ***Hub height* [m]**	**36.5**	**40**	**44**	**49**	**55**	**60**	**65**	**70**	**74**	**86**
Windscherung / *Wind shear*	0.16									
	[dB(A) re 1pW]									
L_{WA} @ 6-10m/s (10 m. ü. G.) / L_{WA} @ 6-10m/s (10 m. a. g. l)	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5

m. ü. G.: Meter über Grund
m. a. g .l: meter above ground level

APPENDIX D - RECEPTOR NOISE LEVEL SUMMARY TABLES

1. Dyonall Farm, Quiet Daytime							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	30.5	31.6	33.1	35.0	37.1	39.5	42.1
ETSU-R-97 Noise Limit (dB)	35.5	36.6	38.1	40.0	42.1	44.5	47.1
Turbine Noise Level (dB)	27.0	32.2	34.2	34.9	35.6	36.4	37.0
Excess Over Limit (dB)	-8.5	-4.4	-3.9	-5.1	-6.5	-8.1	-10.1
1. Dyonall Farm, Night-time							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	28.6	30.1	31.9	34.0	36.2	38.6	40.9
ETSU-R-97 Noise Limit (dB)	43.0	43.0	43.0	43.0	43.0	43.6	45.9
Turbine Noise Level (dB)	27.0	32.2	34.2	34.9	35.6	36.4	37.0
Excess Over Limit (dB)	-16.0	-10.8	-8.8	-8.1	-7.4	-7.2	-8.9
4. Tithe Barn, Quiet Daytime							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	30.7	31.2	32.3	34.1	36.5	39.6	43.2
ETSU-R-97 Noise Limit (dB)	35.7	36.2	37.3	39.1	41.5	44.6	48.2
Turbine Noise Level (dB)	24.5	29.7	31.7	32.4	33.1	33.9	34.5
Excess Over Limit (dB)	-11.2	-6.5	-5.6	-6.7	-8.4	-10.7	-13.7
4. Tithe Barn, Night-time							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	27.3	29.3	31.3	33.5	35.6	37.8	39.9
ETSU-R-97 Noise Limit (dB)	43.0	43.0	43.0	43.0	43.0	43.0	44.9
Turbine Noise Level (dB)	24.5	29.7	31.7	32.4	33.1	33.9	34.5
Excess Over Limit (dB)	-18.5	-13.3	-11.3	-10.6	-9.9	-9.1	-10.4
5. Kelmore Hill Farm, Quiet Daytime							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	30.7	31.2	32.3	34.1	36.5	39.6	43.2
ETSU-R-97 Noise Limit (dB)	35.7	36.2	37.3	39.1	41.5	44.6	48.2
Turbine Noise Level (dB)	27.1	32.3	34.3	35.0	35.7	36.5	37.1
Excess Over Limit (dB)	-8.6	-3.9	-3.0	-4.1	-5.8	-8.1	-11.1
5. Kelmore Hill Farm, Night-time							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	27.3	29.3	31.3	33.5	35.6	37.8	39.9
ETSU-R-97 Noise Limit (dB)	43.0	43.0	43.0	43.0	43.0	43.0	44.9
Turbine Noise Level (dB)	27.1	32.3	34.3	35.0	35.7	36.5	37.1
Excess Over Limit (dB)	-15.9	-10.7	-8.7	-8.0	-7.3	-6.5	-7.8
6. Bergandal, Quiet Daytime							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	30.7	31.2	32.3	34.1	36.5	39.6	43.2
ETSU-R-97 Noise Limit (dB)	35.7	36.2	37.3	39.1	41.5	44.6	48.2
Turbine Noise Level (dB)	28.1	33.3	35.3	36.0	36.7	37.5	38.1
Excess Over Limit (dB)	-7.6	-2.9	-2.0	-3.1	-4.8	-7.1	-10.1
6. Bergandal, Night-time							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	27.3	29.3	31.3	33.5	35.6	37.8	39.9
ETSU-R-97 Noise Limit (dB)	43.0	43.0	43.0	43.0	43.0	43.0	44.9
Turbine Noise Level (dB)	28.1	33.3	35.3	36.0	36.7	37.5	38.1
Excess Over Limit (dB)	-14.9	-9.7	-7.7	-7.0	-6.3	-5.5	-6.8
7. Distington Hall Lodge, Quiet Daytime							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	30.7	31.2	32.3	34.1	36.5	39.6	43.2
ETSU-R-97 Noise Limit (dB)	35.7	36.2	37.3	39.1	41.5	44.6	48.2
Turbine Noise Level (dB)	24.9	30.1	32.1	32.8	33.5	34.3	34.9
Excess Over Limit (dB)	-10.8	-6.1	-5.2	-6.3	-8.0	-10.3	-13.3
7. Distington Hall Lodge, Night-time							
Wind speed (m/s)	4	5	6	7	8	9	10
Background Noise Level (dB)	27.3	29.3	31.3	33.5	35.6	37.8	39.9
ETSU-R-97 Noise Limit (dB)	43.0	43.0	43.0	43.0	43.0	43.0	44.9
Turbine Noise Level (dB)	24.9	30.1	32.1	32.8	33.5	34.3	34.9
Excess Over Limit (dB)	-18.1	-12.9	-10.9	-10.2	-9.5	-8.7	-10.0

Table D1: Predicted Noise Levels vs ETSU-R-97 Derived Noise Limits

Appendix B – Consultation Leaflet

STUBSGILL FARM TURBINE REPOWERING

Constantine Wind Energy (CWE) owns and operates the 250kW wind turbine at Stubsgill Farm. CWE are proposing to replace the turbine with a more modern and larger turbine which will improve the generation of renewable electricity on site. This would result in the displacement of fossil fuels for energy generation, and a contribution to enhancing UK energy security.

This leaflet provides details of the proposed development, and we seek to invite you to a consultation event to be held on **15th May 2024 at Distington Community Centre from 3pm to 7pm**. The wind turbine is located between Distington and Gilgarran. This wind turbine was originally installed in 2015 and has been in operation and generating renewable energy since that time. Set out below is some initial information on the proposal, and some contact details if you have any questions.

Why replace the wind turbine at Stubsgill?

- Strong wind resource known through historical performance.
- Limited visual impact as it's a replacement existing turbine rather than utilising a greenfield location.
- Ability to use existing grid and site infrastructure.
- Improvement of generation on site while keeping to one turbine.
- Enhanced contribution to English and UK renewable energy aims and carbon reduction targets.
- Sustainable use of the land and contributes to UK security of supply.

The Existing Turbine

- 250kW operating capacity
- 45m tip height & 30m rotor diameter
- 30m hub height
- Produces enough power to support 146 average homes*

The Proposed Replacement Turbine

- 250kW operating capacity
- 76m tip height & 52m rotor diameter, 50m hub height. 31m difference in height to existing turbine.
- Estimated to produce enough power to support 285 average homes*

* Renewableuk.com Wind Energy Statistics Explained

STUBSGILL FARM TURBINE REPOWERING

The Process

Site Surveys	Pre-Consultation	Planning Application Submission	Installation
March 2024	May 2024	est. May/June 2024	2024/2025

What's Next

Prior to us submitting a planning application you will have the chance to comment on the proposal. **If you have any feedback you wish to send, or would like a Teams call, please send them to cwe@constantinewindenergy.com for discussion via email before the 24th May 2024**

For further information please see www.constantinewindenergy.com/

About Constantine Wind Energy

Constantine Wind Energy (CWE) is a UK renewable energy company that develops, owns, and maintains onshore wind turbines throughout the UK. The company owns and operates circa 200 wind turbines throughout Great Britain.

Contact Us

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Phone	01483 412060
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CONSTANTINE WIND ENERGY

Appendix C – Shadow Flicker Assessment

Stubsgill Turbine Repowering

Shadow Flicker Assessment

31/05/2024

Prepared by Constantine Wind Energy Limited

Contents

1. INTRODUCTION

1.1. This Shadow Flicker Assessment has been produced in in support of a planning application to be submitted to Copeland Borough Council ("the Council") for the removal of the existing wind turbine and the erection of a single replacement wind turbine up to a maximum of 76m to blade tip height ("the Proposed Development") and revised hardstanding arrangements on land at Stubsgill Farm, Distington, Workington, Cumbria CA14 1QQ ("the Application Site").

1.2. The Proposed Development is centred on National Grid Reference E301868 N523336 at an elevation of approximately 99m AOD.

THE PROPOSED DEVELOPMENT

1.3. The Proposed Development would consist of a single turbine, with an output capacity matched to the 250kW of the existing maximum grid capacity. Constantine Wind Energy Limited ("the Applicant") proposes to use a Vestas V-52 as the candidate turbine, though similar models such as a Vestas V-47 or Enercon E-48 may also be deployed depending on turbine availability, with a maximum tip height of 76m. The Proposed Development will be located at approximate Grid Reference E301868 N523336.

SITE DESCRIPTION

1.4. The Application Site is located in a rural setting on land approximately 1km east of the edge of Distington. The proposed turbine is planned to utilise the existing infrastructure of the wind turbine site and be sited adjacent to the existing wind turbine.

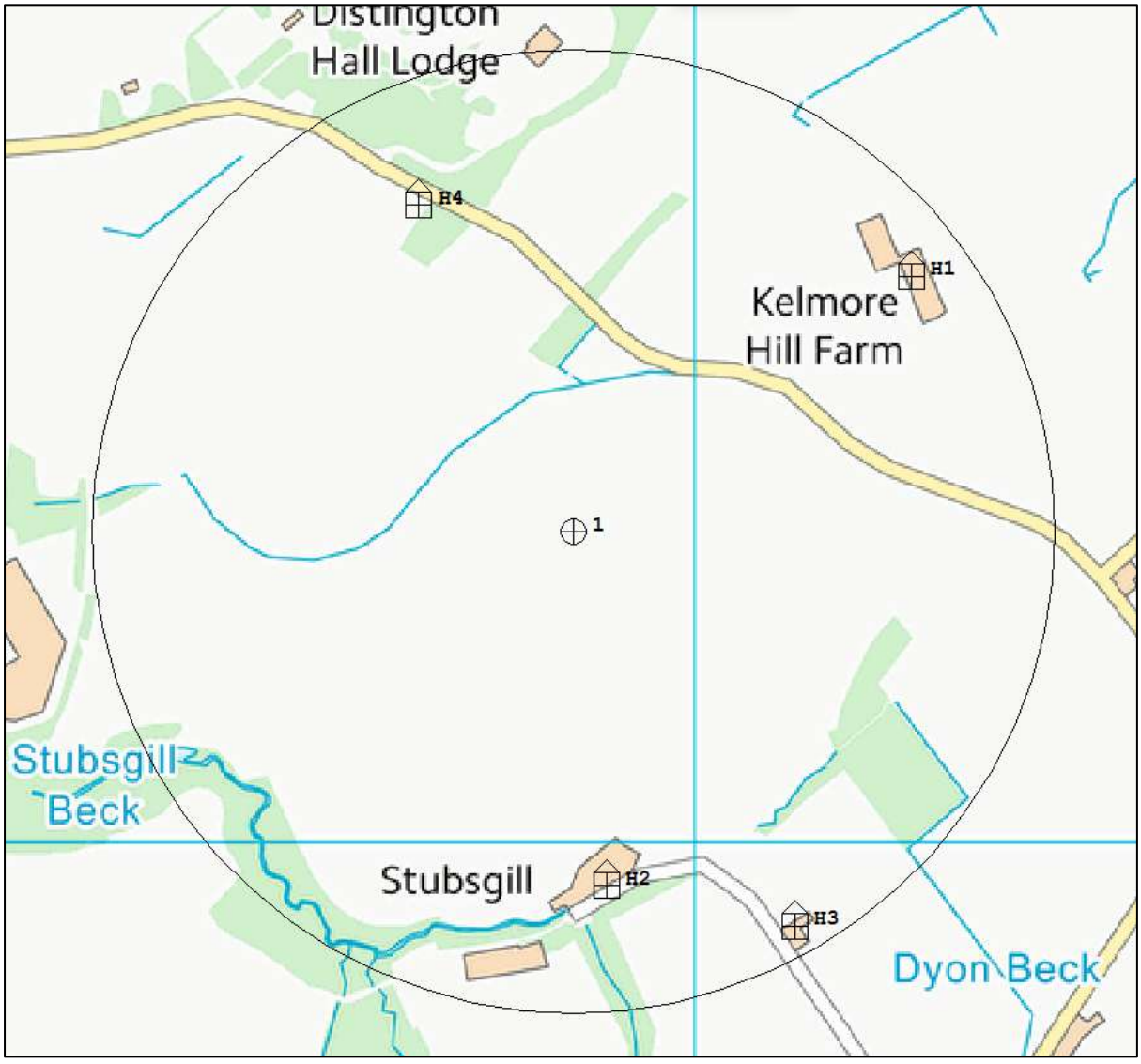
1.5. The existing wind energy development currently comprises one WTN-250 wind turbine which has a hub height of 32m, a rotor diameter of 27m and overall tip height of 45.5m. The turbine has a rated output capacity of 250kW.

1.6. There are three dwellings, or receptors, within 520m (10 times the rotor diameter of the proposed turbine) of the Proposed Development. These are detailed in **Table 1** and **Figure 1** below.

Table 1: Receptors within 520m

ID	Receptor Name	Grid Easting	Grid Northing	Proximity to Turbine (m)	Bearing from Turbine (°)	Financially Involved (Yes/No)
1	Kelmore Hill Farm	302232	523612	455	53	N
2	Stubsgill Farm	301903	522954	380	175	Y
3	Dyon Hill	302107	522911	490	151	N
4	Bergendal	301701	523688	390	335	N

Figure 1: Application Site and Receptors (Not to scale)



1.7. One of these four dwellings is derelict and can be scoped out of the assessment as the property is unable to be occupied. This is property ID4, Bergendal. Photograph evidence of the dereliction is provided in **Part 8: Appendix – Photographs**.

1.8. A further one of these four dwellings can be scoped out of the assessment due to the fact that there are no windows established at the dwelling to enable the possibility of shadow flicker impact. This is ID1 Kemore Hill Farm. The western façade of the dwelling which faces the proposed turbine in a west-southwesterly direction is windowless. Photograph evidence is provided in **Part 8: Appendix – Photographs**.

1.9. The two properties that remain scoped in for assessment are ID2: Stubsgill Farm and ID3: Dyon Hill.

2. EXECUTIVE SUMMARY

2.1. The Proposed Development consists of a wind turbine of 50m hub height, a rotor diameter of 52m and a maximum tip height of 76m. This turbine would replace the existing wind turbine with its dimensions of a hub height of 32m, rotor diameter of 27m and overall tip height of 45.5m.

2.2. Within a study area of 520m – equivalent to 10 times the rotor diameter of the proposed turbine – being examined, exist four receptors, all of which being residential dwellings.

2.3. Two such receptors are at a southerly angle from the turbine, which with possible angles of the Sun at UK latitudes means that it is cannot be affected by the proposed turbine's shadow flicker. One further receptor, to the northwest, is derelict and not relevant to assessment. A further final receptor, to the northeast, has no window facing the proposed turbine and is not relevant to assessment.

2.4. Due to the lack of impact, no immediate mitigation is conditioned.

3. ASSESSMENT CRITERIA

3.1. 'Shadow Flicker' is the strobe effect caused when a wind turbine's rotating blades intermittently cast shadows over enclosed apertures as they turn. This is most prevalent in dwellings with small windows, where the blades can cause a flicking light effect as their shadows momentarily disrupt the emergence of sunlight into an interior.

3.2. The duration, significance, and likelihood of shadow flicker is influenced by a number of factors:

- Sun height and position (and, correspondingly, time of year and day);
- Prevalence of clouds;
- Direction of turbine relative to receptor;
- Distance from turbine to receptor;
- Prevalence of objects between the turbine and receptor which may act as a screen;
- Turbine rotor diameter and height;
- Window size at the receptor;
- Wind speed;
- Wind direction;

3.3. Only properties within 130 degrees either side of north can be affected at UK latitudes and at distance the effects of shadow flicker are reduced – being proven to occur only within ten rotor diameters of the turbine.[1]

3.4. The assessment area for this turbine will reach 10 times the proposed rotor diameter – equivalent to 520m radius around the turbine – encompassing all the dwellings provided in Table 1. For completeness, dwellings outside of 130 degrees either side of north from the turbine will be included for assessment. Buildings may be scoped out of assessment on a individual basis.

3.5. There is no formal threshold defined by local or national Government for the amount of shadow flicker effect that can be considered acceptable. However other European countries do provide guidance and there is a typically agreed limit as practiced by various nearby countries including

[1] Office of the Deputy Prime Minister, Planning for Renewable Energy A Companion Guide to PPS22 (2004)

Northern Ireland. This recommends that shadow flicker effects should not exceed '30 hours per year or 30 minutes per day', quoting a previous survey undertaken by Predac, an organisation sponsored by the European Union to promote best practice. This recommendation will be used as a reference guide ("PPS18").[2]

[2] Best Practice Guidance to Planning Policy Statement 18 'Renewable Energy' (2009)

4. ASSESSMENT RESULTS

4.1. An assessment of the potential for shadow flicker effects has been carried out in accordance with the above. This assessment has taken a conservative approach, assuming windows facing from the nearest side of the receptor towards the proposed turbine; cloudless skies at all times; and open ground between turbine and receptor with no screening of the receptor by intermediary objects. Only distance and landform (utilising OS digital terrain model elevation mapping) may screen a receptor.

4.2. Windfarm 4.2.1.7 has been used as the software modelling the results of shadow flicker. The assessment has been carried out utilising the model of a Vestas V-52, with a 50m hub height and 52m rotor diameter. A study area of 520m radius regardless of bearing from turbine has been examined.

4.3. Table 2 provides the summary of modelled, worst case shadow flicker effects at each property within the scope of the assessment, in decimalised time where 0.5 hours = 30 minutes.

Table 2: Shadow Flicker Assessment Results

ID	Receptor Name	Number of Days in a Year with Flicker Event (Days)	Longest time of any one Flicker Event in the Year (Hours)	Average Event Length on any one Day (Hours)	Sum of all Hours of Flicker Events in one Year (Hours)	Months in Year with Shadow Flicker Events
2	Stubsgill Farm	0	0	0	0	n/a
3	Dyon Hill	0	0	0	0	n/a

4.4. Both the properties relevant to the assessment are situated south of the proposed development, and as such being in UK latitudes cannot be reached by turbine shadows.

4.5. Exact detail of the timing of potential flicker events is provided in Part 7: Appendix – Data.

5. MITIGATION

5.1. No shadow flicker is calculated to be possible. As a consequence, no mitigation is required.

5.2. If shadow flicker were to occur, there are several forms of mitigation available, including:

5.2.1. Control at Receptor: The provision of blinds, shutters or curtains to affected properties;

5.2.2. Control on Pathway: Screening planting close to an affected property; and

5.2.3. Control at Source: Shutdown of the turbine at times when effects occur.

6. CONCLUSION

6.1. Within a study area of 520m – equivalent to 10 times the rotor diameter of the proposed turbine – there are four existing receptors that may be susceptible to shadow flicker, all of which being residential dwellings. One of these receptors is derelict and one has no windows facing the proposed turbine, causing both to be screened out of assessment.

6.2. Of the two receptors relevant to this assessment, both are situated south of the proposed turbine and have been calculated to receive 0 hours 0 minutes of shadow flicker in any one year.

6.3. No mitigation is required due to the lack of impact.

7. APPENDIX – DATA

Turbine	Easting	Northing					
1	301868	523336					
House	**Easting**	**Northing**	**Date**	**Start Time**	**End Time**	**Duration**	**% Cover**
2	301903	522954	n/a	n/a	n/a	0	n/a
3	302107	522911	n/a	n/a	n/a	0	n/a

8. APPENDIX - PHOTOGRAPHS

BERGENDAL – EVIDENCE OF DERELICTION

Front side of dwelling

Rear of dwelling (facade facing a copse of trees and further afield the turbine site)

KELMORE HILL FARM – EVIDENCE OF LACK OF WINDOWS

West-southwestern facing façade of the property. Photograph taken from angle of site location.