



Mynydd Maen Wind Farm

DNS Application:

Green Infrastructure Statement

June 2024



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1. Introduction

1.1 Background

- 1.1.1 RES Ltd (“RES” or “the Applicant”) is applying to Welsh Ministers for permission to construct and operate the Mynydd Maen Wind Farm (“the Proposed Development”) at a site located between Newbridge and Cwmbran, partly in the Caerphilly County Borough Council area (CCB) and partly in the Torfaen County Borough Council area (TCB).
- 1.1.2 The Planning (Wales) Act 2015 and the Developments of National Significance (Wales) Regulations 2016 (as amended) and subsequent regulations, provides the statutory basis for Developments of National Significance (DNS). Any proposal to construct or operate an onshore wind generating station with a capacity over 10 mega-watts (MW) falls under the DNS system and requires Welsh Ministers’ consent.
- 1.1.3 The Proposed Development comprises the construction and operation of up to 13 wind turbines and associated infrastructure. The proposal is therefore classed as a DNS as the combined installed capacity of the power generating elements will be greater than 10 MW.
- 1.1.4 The Proposed Development exceeds the threshold for onshore wind developments set out in Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (as amended) (the “EIA Regulations”). In addition, the Proposed Development could potentially result in ‘significant’ environmental effects according to the EIA Regulations, therefore the Proposed Development is classified as an EIA development and an Environmental Statement (ES) is required.

1.2 Requirement for a Green Infrastructure Statement

- 1.2.1 This document forms a Green Infrastructure Statement (GIS) which is a requirement of Planning Policy Wales Edition 12 (PPW). Notification of the update to Chapter 6 of PPW was published by way of a Heads of Planning letter on 18th October 2023. The Chapter 6 update was stated to have immediate effect in advance of the next iteration of PPW Edition 12. PPW Edition 12 was subsequently published in early February 2024.
- 1.2.2 The updated policy position includes a stipulation that a GIS should be submitted with all planning applications to describe how green infrastructure has been incorporated into a proposal. In particular the GIS must also be used to demonstrate how the ‘step-wise’ approach as set out in PPW has been applied.
- 1.2.3 It should be noted that the site selection and design process for the Proposed Development was undertaken prior to the publication of the Heads of Planning letter in October 2023, including the identification of a range of necessary mitigation, monitoring as well as biodiversity enhancements and related positive outcomes that the Proposed Development would give rise to. Nevertheless, the new policy requirements have been addressed.
- 1.2.4 This document signposts the information that has been prepared as part of the application for the Proposed Development and this consists in large parts of material which is contained within the ES. The information accords with the required content of a GIS as described in PPW. In particular, the information provided demonstrates how the step-wise approach has been inherent throughout the site selection and development process for the Proposed Development and through the application of design principles which have sought to minimise adverse and environmental effects and which have also included as an outcome, a net benefit for biodiversity.

1.3 Structure of Document

1.3.1 This document is structured as follows:

- > Chapter 2 outlines the policy framework with specific regard to the requirement for a Green Infrastructure Statement as referenced in national planning policy. Reference is also made to the regional and local policy framework with regard to green infrastructure assessments which have been undertaken by the respective Councils. This therefore provides a national perspective on the policy framework and also highlights relevant locally based planning guidance which is available and which has been taken into account.
- > Chapter 3 references the relevant information, surveys and assessment work which has been undertaken in support of the Proposed Development and explains how the step-wise approach has been applied to site selection and the design of the proposal. A description is also provided of the net benefit for biodiversity that would result from the Proposed Development.
- > Chapter 5 provides overall conclusions.

2. The Policy Framework

2.1 Planning Policy Wales Edition 12

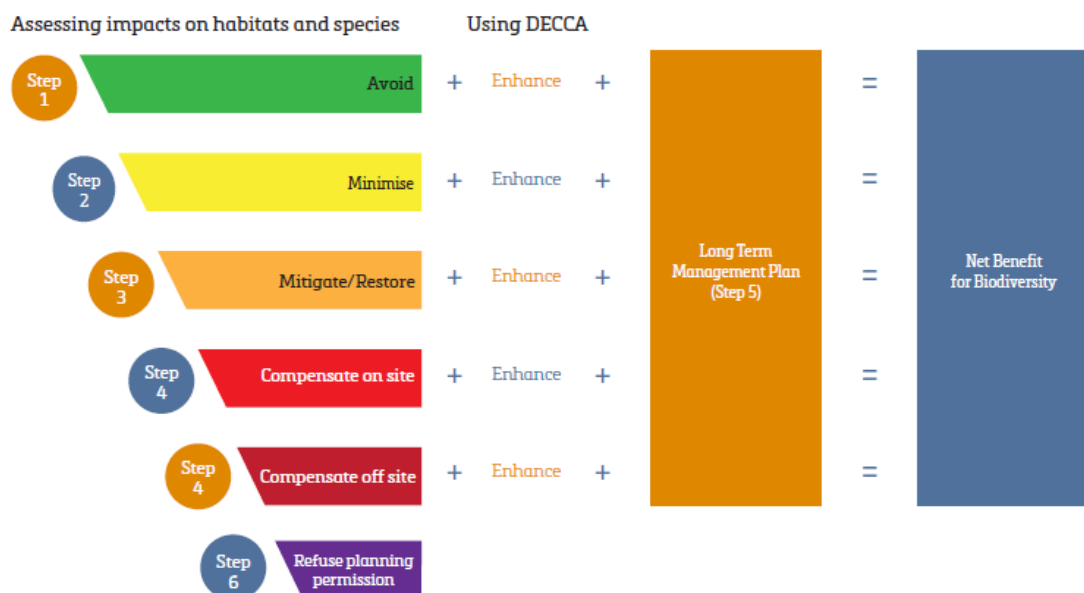
Green Infrastructure Statements

- 2.1.1 PPW 12 was published in February 2024. Chapter 6 of PPW is entitled 'Distinctive and Natural Places' and section 6.2 refers to green infrastructure. At paragraph 6.2.1 green infrastructure is defined as follows:
- "Green infrastructure is the network of natural and semi-natural features, green spaces, rivers and lakes that intersperse and connect places. Component elements of green infrastructure can function at different scales and some components, such as trees and woodland, are often universally present and function at all levels. At the landscape scale green infrastructure can comprise entire ecosystems such as wetlands, waterways, peatlands and mountain ranges or be connected networks of mosaic habitats, including grasslands. At a local scale, it might comprise parks, fields, ponds, natural green spaces, public rights of way, allotments, cemeteries and gardens or may be designed or managed features such as sustainable drainage systems".*
- 2.1.2 Paragraph 6.2.3 states that green infrastructure is capable of providing several functions at the same time and as a result, can provide multiple benefits, for social, economic and cultural as well as environmental resilience.
- 2.1.3 PPW contains detailed advice for the preparation of Green Infrastructure Assessments which are primarily undertaken by Local Authorities. Paragraph 6.2.12 of PPW makes specific reference to GISs and states:
- 2.1.4 "A green infrastructure statement should be submitted with all planning applications. This will be proportionate to the scale and nature of the development proposed and will describe how green infrastructure has been incorporated into the proposal.
- 2.1.5 The green infrastructure statement will be an effective way of demonstrating positive multi-functional outcomes which are appropriate to the site in question and must be used for demonstrating how the step-wise approach (Paragraph 6.4.15) has been applied".
- 2.1.6 Paragraph 6.2.14 states that "Development proposals should be informed by the priorities identified in green infrastructure assessments and locally based planning guidance".
- 2.1.7 In this regard, Section 2.3 below makes reference to the Green Infrastructure Assessments which have been prepared by both TCB and CCB.
- 2.1.8 Section 6.4 of PPW makes reference to 'biodiversity and ecological networks'. It sets out that the Environment (Wales) Act 2016 introduced an enhanced biodiversity and resilience of ecosystems duty (known as the "Section 6 Duty").
- 2.1.9 Paragraph 6.4.5 of PPW makes reference to the Section 6 Duty and states a number of points including, in summary:
- > Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions;
 - > This means development should not cause any significant loss of habitats or populations of species, locally or nationally;
 - > Development must provide a net benefit for biodiversity and improve or enable the improvement of the resilience of ecosystems.

The Step-Wise Approach & Net Benefit for Biodiversity

- 2.1.10 Paragraph 6.4.5 also makes reference to the step-wise approach which it states is:
“the means of demonstrating the steps which have been taken towards securing a net benefit for biodiversity. In doing so, planning authorities must also take account of and promote the resilience of ecosystems, in particular the following attributes, known as the DECCA Framework”.
- 2.1.11 A net benefit for biodiversity is described as: *“the concept that development should leave biodiversity and the resilience of ecosystems in a significantly better state than before, through securing immediate and long-term, measurable and demonstrable benefit, primarily on or immediately adjacent to the site”.*
- 2.1.12 The attributes of the DECCA Framework are set out as being:
- > *“diversity between and within ecosystems;*
 - > *the extent or scale of ecosystems;*
 - > *the condition of ecosystems including their structure and functioning;*
 - > *the connections between and within ecosystems; and*
 - > *adaptability of ecosystems including their ability to adapt to, resist and recover from a range of pressures likely to be placed on them through climate change for example”.*
- 2.1.13 Paragraph 6.4.8 makes further reference to the step-wise approach and states that it will
“help guide decision makers in securing a net benefit for biodiversity and the onus is on developers to bring forward proposals in a way which will achieve a net benefit for biodiversity demonstrating how they have used the step wise approach”.
- 2.1.14 Paragraph 6.4.12 makes reference to Figure 12 in PPW which sets out the various steps within the step-wise approach. This is provided below as **Figure 2.1**.

Figure 2.1: Summary of the Stepwise Approach



- 2.1.15 PPW states that “*Having worked iteratively... through the stages of the step-wise approach below, and providing evidence in the Green Infrastructure Statement that the step-wise approach has been followed, a scheme of enhancements must be provided to ensure a net benefit for biodiversity*”. (underlining added)
- 2.1.16 The step-wise approach is referenced in detail from paragraph 6.4.15 in PPW and key points in this regard include the following:
- > The first priority for planning authorities is to avoid damage to biodiversity in its widest sense.
 - > Proposals in statutory designated sites are, as a matter of principle, unacceptable and therefore must be excluded from site searches undertaken by developers.
 - > This principle also extends to sites containing protected species and habitats which are deemed irreplaceable. Irreplaceable habitats are referenced in PPW at footnote 129.

2.2 Local Plans and Policies

NRW Area Statements

- 2.2.1 In 2020, Natural Resources Wales (NRW) published the first version of Area Statements, which cover seven different and diverse parts of Wales. The Area Statements set out the key challenges and opportunities to strengthen ecological networks and ecosystem services at a local scale. They identify areas where taking action at the right scale can maximise benefits.
- 2.2.2 NRW state that in the Southeast¹ they have taken a:
- “landscape scale approach to producing the Southeast Area Statement. This means that we have considered where and why we want to build ecosystem resilience in terms of the special and distinctive landscape areas of our place. Working in this way will allow us to address the increasingly complex and widespread environmental, social and political challenges that transcend traditional management boundaries. These challenges, including the climate and nature emergencies, will require us all to work differently. To do this, we have to really understand the people, the place and the ways in which we interact with the environment.*
- To realise the benefits that nature can provide, our natural areas must be healthy and resistant to threats and disturbance. The capacity of natural resources to provide this function is called Ecosystem Resilience. Ecosystem Resilience can be considered a measure of health. The healthier (or more resilient) the ecosystem is, the more likely it is to survive, thrive and benefit people and communities.”*
- 2.2.3 The Southeast Area Statement contains four themes, namely:
- > Linking Our Landscapes;
 - > Climate Ready Gwent;
 - > Healthy, Active, Connected; and
 - > Ways of Working.
- 2.2.4 The Statement sets out that the collaborative actions identified under each theme are underpinned by best available evidence, local knowledge and understanding gathered throughout this process.
- 2.2.5 The outcomes under each of the four strategic themes are intended to deliver the Area Statement Vision for the Southeast.
- 2.2.6 Given the nature of the proposed development, the theme of ‘Climate Ready Gwent’ is particularly pertinent. It is set out that:

¹ NRW Southeast Area Statement.

“Climate change is the globally defining challenge of our time. Our changing climate will affect our communities, the services we deliver, our assets and infrastructure. It is clear from the work that we have undertaken relating to this strategic theme that the changing climate necessitates changing the ways in which we work together to address it.

The potential risks of climate change are far and wide ranging, with the potential to affect all biodiversity and how it interacts within the world. The climate is changing rapidly and in 2019, Welsh Government declared a climate emergency. Biodiversity and well-functioning ecosystems provide natural solutions to build community resilience, support livelihoods, improve wellbeing and contribute to sustainable development.”

The ‘Climate Ready Gwent’ strategic theme focuses on taking every opportunity to address the root cause of issues and to do so collaboratively as partners, shifting the focus from risk to opportunity and putting communities at the centre. The Climate Ready Gwent Theme Network has explored how and where we can work better together to act on the causes and adapt to the consequences of climate change.”

Torfaen County Borough Council

- 2.2.7 TCB published a ‘Torfaen Green Infrastructure Assessment’ in December 2021 (TGIA). It references green infrastructure as defined in PPW and also makes particular reference to the Well-being for Future Generations Act 2015, which it states challenges public bodies to think holistically about issues to ensure:
- “that the needs of the present are met without compromising the ability of future generations to meet their own needs”.*
- 2.2.8 The TGIA states that there needs to be a strategic view of the management and development of land resources and green infrastructure is seen as an approach that promotes a way of tackling diverse and often competing land management issues in a spatially coherent manner.
- 2.2.9 Page 5 of the TGIA states that it is intended to form a baseline for a positive and proactive approach to the management and enhancement of Torfaen’s natural assets, in particular when associated with the level of growth identified in the Replacement Local Development Plan (RLDP). It also states that:
- 2.2.10 “This document will provide a mechanism to support the implementation of local planning policies on Green Infrastructure, with the aim of promoting a Green Infrastructure approach to land use planning, design and management. This will ensure Green Infrastructure forms an integral and significant part of development and wider infrastructure proposals.”
- 2.2.11 In terms of local biodiversity issues, the TGIA states that the following issues are a particular problem in Torfaen:
- > A reduction in tree canopy and consistent non-replacement of mature street trees;
 - > Habitat fragmentation;
 - > Lack of connectivity between wildlife sites;
 - > Habitat patch isolation (linking to fragmentation and connectivity);
 - > Declining area of existing sites;
 - > Building too close to existing mature trees, hedgerows, woodland and ancient woodland sites;
 - > Lack of grassland habitat;
 - > Continuing loss of semi-natural grassland areas to development and agricultural improvement;
 - > Insufficient management of key habitats;

- > Invasive non-native species;
- > Poor ecological status of some of Torfaen's water courses;
- > Upland drainage;
- > Historic approaches to the management of water in the Uplands has impacted on bog and mire habitat;
- > More water retention interventions are required to reverse the damage; and
- > Inhospitable urban environments.

2.2.12 Page 23 of the TGIA sets out a vision for green infrastructure in Torfaen. The issues have been prioritised into four key 'Green Infrastructure Themes' as follows:

- > Theme 1: Improve Ecological Resilience – conserving and enhancing biodiversity and geodiversity, through the protection and enhancement of habitats, wildlife sites and the connectivity of key habitats.
- > Theme 2: Mitigate and Adapt to Climate Change – manage the impact of climate change by developing initiatives that reduce greenhouse gas emissions and that actively take carbon dioxide out of the atmosphere; promote access to green routes that reduce the need for travel by car; and create green infrastructure that supports our adaptation to a changing weather pattern through, for example, flood control.
- > Theme 3: Placemaking - Green infrastructure plays a key role in placemaking, ensuring Torfaen remains a place where people want to live and invest. It can help attract and maintain high-quality workers and visitors, as well as contributing to the character of our settlements and countryside to create attractive and distinctive new places.
- > Theme 4: Healthier Torfaen – Green infrastructure can support healthy and active lifestyles, promote good mental health, inspire learning and create a sense of community by maintaining spaces for cultural activities.

2.2.13 Page 23 of the TGIA sets out the Public Service Board's 'Green Infrastructure Vision' for Torfaen, which is expressed as follows:

“Torfaen has a well-connected, multi-functional green infrastructure network of distinctive, biodiverse and resilient natural spaces, which provide well-being benefits for people and nature. Our natural resources and ecosystems are managed in sustainable ways that maintain, protect and enhance the network's integrity and connectivity, while recognising the interdependency of Torfaen's biodiversity, landscapes and cultural heritage.”

2.2.14 Page 24 of the TGIA sets out the benefits of green infrastructure and states that green infrastructure assets provide societal benefits which can help to contribute to the health, wealth and well-being of Torfaen. It states that well designed and managed green infrastructure can help:

- > Address climate change;
- > Improve our health and wellbeing;
- > Develop ecological resilience; and
- > Create great places to live.

2.2.15 Page 31 of the TGIA sets out that the objective of the overall assessment is to:

- a) Identify green infrastructure assets and the functions that contribute to each of the green infrastructure themes.
- b) Map the baseline of green infrastructure assets and functions across Torfaen on GIS.
- c) Develop an urban green grid map of green, ecological and leisure corridors across Torfaen which link these assets and create a Urban Green Infrastructure Network.

- d) Provide evidence for the protection of this network on urban green grid through LDP policy.
- e) Identify areas of need based on baseline mapping; and
- f) Provide guidance on ways in which green infrastructure can be improved and enhanced, depending on need.

2.2.16 The TGIA is to be reviewed on a five-yearly basis to assess delivery of actions.

Caerphilly County Borough Council

2.2.17 The Caerphilly Green Infrastructure Strategy was adopted by CCB in November 2020. Whilst implemented prior to the update to PPW, the strategy includes an assessment of green infrastructure with district wide mapping of the relative importance of existing assets and identified need. The strategy also includes 10 principles which are applicable to new development that, when followed, should lead to the development of new and enhancement of existing green infrastructure. Of these principles, the four listed below are relevant to the Proposed Development.

- > **New development:** New developments can provide both opportunities and constraints for green infrastructure. Early integration of green infrastructure into the planning process (such as pre-application advice) will ensure it is properly planned in advance of development and/or delivered on a phased basis. An important development in 2019 was the introduction of the requirement for surface water drainage for new developments to comply with mandatory national standards for SuDS.
- > **Multifunction:** One of the most important facets of green infrastructure. Wherever possible, green infrastructure should be designed and managed as multifunction resources, delivering the widest range of linked environmental and social benefits. The understanding of this is key to its longer-term development and implementation.
- > **Linkages:** New sites and habitats should be created for people and wildlife to compliment existing projects and green infrastructure. This strengthens and reinforces networks and enhances connectivity. It can also promote public access to green infrastructure and contribute to active travel.
- > **Understanding existing networks:** An understanding is needed of existing networks. This relates to organisational information (such as that provided by NRW) as well as physical networks such as paths, trails, waterways and roads. It also assists in understanding the character of the area and where there may be needs and deficiencies.

2.2.18 The detail provided in Chapter 3 of this document demonstrates how the Proposed Development would accord with and contribute to these principles.

3. The Step-Wise Approach

3.1 Introduction

3.1.1 This Chapter explains how the principles set out in the step-wise approach have informed the site selection and design of the Proposed Development, and how habitat management measures have been derived in line with the DECCA framework to deliver biodiversity net benefit.

3.1.2 This chapter also describes the positive multi-functional outcomes that will be realised as a result of the Proposed Development.

3.1.3 Consistent with policy and PPW which states that Green Infrastructure Statements should highlight the baseline data that is being considered together with any associated surveys and assessments undertaken, the Environmental Statement that is submitted as part of the planning application for the Proposed Development/following list of submission documents details the relevant baseline data, surveys and assessments undertaken for the Proposed Development.

- > Baseline Landscape Assessment
- > Landscape and Visual Impact Assessment
- > Ecological Desk Study
- > Phase 1 Habitat and NVC survey.
- > Bat surveys.
- > Great crested newt survey
- > Dormouse survey
- > Otter and water vole survey
- > Reptile habitat assessment
- > Ornithological Desk Study
- > Ornithological Field Surveys (Vantage Point surveys, Breeding Raptor surveys, Breeding Wader survey, Nightjar survey)
- > Cultural Heritage Assessment including a Settings Assessment
- > Desk study of data sources and site walkover for identification of the current hydrological and hydrogeological characteristics of the site
- > Watercourse survey
- > Peat survey
- > Geotechnical investigation (boreholes and trial pits)
- > Background Noise Assessment

3.2 Site Selection

3.2.1 RES Ltd identifies potential sites for wind farm development in Wales through a constraints-based feasibility approach, with sites being evaluated against several criteria:

- > Wind Speeds/Energy Yields: Sufficiently high wind speeds to ensure energy production from the wind turbines that would yield an adequate return on investment;

- > Planning: A site which complies with planning policy and in particular, avoids unacceptable effects on areas that have been designated by statutory agencies; maintains appropriate distances from dwellings to avoid unduly impacting local amenity; and avoids impeding or interfering with major electromagnetic transmission and airport communication systems;
- > Area of Site: A site must have sufficient area to accommodate the number of wind turbines required for economic viability;
- > Access: Adequate vehicular access to a site using existing roads wherever possible to minimise the amount of civil works, particularly during the construction phase;
- > Local Terrain and Topography: Terrain and topography affect wind flow across a site and need to be considered in relation to turbine performance, specification and life-span;
- > Ground Conditions: A site must have suitable ground conditions for the construction of wind turbine foundations, erection of the turbines and the provision of access tracks and cables.

3.2.2

Overall, the Site was considered to be suitable due to a range of factors:

- > excellent wind resource;
- > the majority of the site is located in a Future Wales PAA for Wind Energy, within which the principle of developing large scale wind farms is supported;
- > large usable area;
- > low vulnerability to major accidents and disasters arising from, for example, flooding or sea level rise, due to location;
- > good potential access;
- > available existing electric infrastructure nearby;
- > not on national statutory designations;
- > likely low impact on ecology, archaeology, geology etc. given the baseline conditions, both from the Proposed Development and from potential major accidents and disasters (although these could only be confirmed subsequently once the necessary surveys had been undertaken).

3.3

Design Approach

3.3.1

The approach to wind farm design has been informed by consultation meetings with Torfaen County and Caerphilly County Borough Councils, EIA scoping, design team meetings (to discuss constraints and opportunities), desk study and extensive survey work. The latter has included botanical, protected species, ornithological, hydrological and peat survey. Measures to avoid and minimise impacts on ecological features in line with the step-wise approach are as follows:

- > Turbine locations, the orientation and micro-siting of crane pad locations and the routing of access tracks have minimised impacts on localised deeper peaty soils (and associated habitats).

- > The wind farm has been designed to avoid/minimise hydrological impacts through designed in mitigation that includes upslope drainage and interception ditches and trackside drains, a culvert system to route water through the built wind farm, and downslope, contour-parallel recharge trenches that will allow ground infiltration during normal flow conditions and diffuse overtopping during significant rainfall events. This will reproduce the cross-slope distribution and nature of the hillslope hydrology pre-construction. The result will be that outside the footprint of the wind farm hydrological impacts on habitat will be minimal.
- > The design has evolved to minimise impacts on ecological features through measures including avoidance of / stand offs from:
 - > Groundwater Dependent Terrestrial Ecosystems (GWDTEs) (including flushes and wet heath communities);
 - > The heads of stream valleys abutting the Site (as detectors close to valley woodlands have shown locally elevated levels of bat activity);
 - > Moorland edge habitats, as these areas have greater structural diversity than those across the wind farm site, are used more by bats than the open plateau on which the turbines would be located, and are of greater likely value to other species groups such as reptiles based on an assessment of habitat quality.

3.3.2 The result has been that the ecological impact of the scheme has been minimised, as far as is possible given other constraints and viability considerations, through the design process, and demonstrates that the step-wise approach has been followed.

3.4 Net Benefit for Biodiversity

3.4.1 The approach to delivering Biodiversity Net Benefit at Mynydd Maen will be set out in a detailed Habitat Management Plan (HMP) that will be produced as a condition of consent. Enhancements will be completed within the Site boundary.

3.4.2 The HMP will be based on the Commons Innovation Plan (TACP, 2019). The Innovation Plan was produced on behalf of the Mynydd Maen Commoners Association and Torfaen County Borough Council. The aim of the Plan was to create a more sustainable approach to the management of the common and to take steps to maintain and enhance its biodiversity value. However, since the production of the Plan, funding for implementation has disappeared; conservation management is currently limited and completed by the commoners at their own expense. Without more extensive management the condition of the common will continue to decline, with invading bracken, feral trees and the potential for heathland fires (resulting from large stands of mature heather) to damage large parts of the area.

3.4.3 Key elements of the HMP will be as follows:

- > Restoration and management of dry heath;
- > Bracken control;
- > Control of feral (invasive) trees;
- > Pond creation and management; and
- > Hydrological re-naturalisation to improve the condition of areas of wet heath.

Restoration and Management of Dry Heath

- 3.4.4 Restoration and management of dry heathland will be achieved through rotational cutting and baling of over-mature heather, and through bracken management. The cutting programme will be designed for both biodiversity benefit and fire management objectives. The aim will be to establish patchworks of mixed age heather in areas where over mature stands currently dominate. A minimum of 100 hectares of land will be managed in this way each year. Given current (low) cattle stocking rates on the common / the availability of stock, a mixed age sward is not expected to be maintained through grazing, and a programme of mechanical cutting will be prescribed through the Habitat Management Plan. This management regime will result in greater botanical diversity, and will also benefit reptiles, invertebrates and species such as red grouse through providing varied structure (and different foraging opportunities) to the heathland.

Bracken Management

- 3.4.5 Bracken management will aim to reduce extensive stands that dominate large areas of the common around the edges of the Site and have begun to invade the interior of it. Bracken has value for invertebrates, breeding birds, reptiles and other species groups, but its value is reduced as areas of cover become very large and dense and a litter layer accumulates. Bracken outcompetes heather reducing the extent of heathland habitats and has spread onto the open heath in places. Some work is done to control and reduce bracken by the commoners, but this is currently limited in extent. The aim of bracken management will be to create more Ericoid-dominated habitat and more mosaic habitats around the fringes of the Site. Breaking up the bracken will allow cattle access to some marginal areas of the common. Mechanical intervention is likely to be needed to maintain these as open areas.

Feral Tree Control

- 3.4.6 Feral trees are spreading from the plantation habitats onto the heathland. These need to be systematically removed, with any cone / seed-bearing trees taken from the Site (into the plantation) to prevent further self-seeding. Currently there is no effective control of conifers, albeit trees are cut and removed by the commoners at small-scale. Over time colonisation by feral trees has the potential to result in considerable loss of heathland habitat to coniferous woodland.

Pond Creation

- 3.4.7 The restoration of the (potential) on-Site borrow pits presents an opportunity to create several further ponds / clusters of ponds. These will be designed for amphibians by an experienced ecologist. Hibernacula will be constructed around and between them using rock and soil sourced from the Site. The ponds will also provide invertebrate rich feeding areas and drinking resources for red grouse (and other birds, mammals and stock), and the hibernacula will provide opportunities for reptiles. Further pond creation will be completed in the areas identified for common land swap. This pond creation will focus on increasing the resilience of the great crested newt population present on site.

Hydrological Renaturalisation

- 3.4.8 As detailed in Chapter 9: Hydrology and Hydrogeology of the ES, although BGS maps show no superficial deposits, peat is present within the site boundary. A comprehensive peat survey, covering nearly 4000 points within the red line boundary, has been conducted. The results are shown in Figure 9.3: Peat Depth Plan and Technical Appendix 9.3: Soil and Peat Management Plan of the ES. Compared to peatland sites further north in Wales and the rest of the UK, the site contains relatively little peat. This is likely because the site is climatically marginal for blanket mire development. The area's rain-shadow location east of the South Wales high ground results in relatively low rainfall, and its southern position leads to higher evapotranspiration due to warmer temperatures.

- 3.4.9 These factors contribute to lower water tables, resulting in a higher rate of organic matter decomposition relative to its accumulation. Nonetheless, the site layout design has taken the findings from the extensive site investigations and peat surveys into account, avoiding peat areas as much as practicably possible.
- 3.4.10 Previous work on the Site undertaken by an ecohydrologist working on behalf of TCBC identified that the main area of bog has been modified by peat-cutting and/or peat movement, such that the original surface is broken, with areas at various elevations separated by steep slopes/sub-vertical edges (Rob Low, pers comm). Completed work to address this, as far as it was feasible to do so, involved smoothing sub-vertical edges to try to reduce hydraulic gradients.
- 3.4.11 Hydrological naturalisation will involve damming of the (relatively few) obvious drainage ditches during construction, using clay or similar poorly permeable infill. Regular dams will increase transient water storage and reduce short-term storm runoff response.
- 3.4.12 The resulting pools have the potential to develop a valuable flora, to provide drinking water for birds, wild mammals and livestock (encouraging grazing animals to use different areas of the common), and to provide further breeding opportunities for amphibians and invertebrates.
- 3.4.13 The range of measures to improve the condition of wet and dry heath habitats, including areas where shallow peats exist, will have wider ecosystem service benefits. These include slowing surface water runoff during rainfall events due to the greater 'canopy' storage and hydrological roughness of heath in comparison to grassland. Greater on-site storage of water can in turn promote groundwater recharge, and wet heath communities and soils also have a higher carbon content than grasslands.

3.5 DECCA Framework

- 3.5.1 Achieving ecosystem resilience is a key element in achieving biodiversity net benefit. A simplified breakdown of how the measures proposed deliver resilience is provided in **Table 3.1** below, based on the DECCA Framework.

Table 3.1: Application of DECCA Framework

DECCA Attribute					
Action	Diversity	Extent	Condition	Connectivity	Adaptability
Restoration and Management of Dry Heath	Cutting of old growth heather will increase botanical diversity.	The extent of heather moorland will be maintained / increased through bracken management	Condition will be improved as a result of mixed age structure to the heath.	N/a	The breaks created in the heather will make the moorland more able to recover from uncontrolled burns.
Bracken Management	Reducing bracken cover will allow more diverse heathland and grassland habitats to re-establish on the common.	Bracken management will increase the extent of more valuable heathland habitats on the common.	A reduction in bracken will improve the condition of the heathland.	N/a	Increasing the extent and improving the condition of the moorland will make it more adaptable to changing environmental conditions.
Feral Tree Control	Reducing feral tree growth will ensure more diverse heathland and grassland habitats are not lost.	Feral trees will, over time, result in parts of the common land becoming wooded. Their removal will ensure the extend of the common, and the important habitats within it, is retained.	Removing feral trees will improve the condition of habitats on the common.	Feral tree growth could result in fragmentation of the heathland habitats on the common. Removal of the feral trees will prevent this,	Maintaining the common as an extensive area of open heathland with local variation in characteristics (due to wetness, aspect and topography) will make it more adaptable to changing environmental conditions.
Pond Creation	Ponds of different sizes, designed for wildlife will help maintain and enhance the diversity of species using the common.	The extent of pond habitat will be increased.	The condition of existing ponds is declining. The new pond resource will improve conditions for a range of species reliant on freshwater.	Pond creation will result in the establishment of stepping stones across the site / the local landscape for freshwater invertebrates, amphibians, reptiles and other species groups that	The water sources available will provide drinking opportunities for stock (making for more even grazing of the common), and for a variety of other locally important species

				favour wetland habitats.	including red grouse.
Hydrological Renaturalisation	Rewetting of areas will lead to an increased botanical and invertebrate diversity.	The areas of wet heath will be maintained or increased.	Renaturalisation will improve the condition of the wet heath habitats by locally raising the water table.	N/a	The rewetting measures will make the heathland habitats more resilient to periods of hot and dry weather.

3.6 Carbon Balance

- 3.6.1 The total CO2 emissions savings from the proposed wind farm are calculated by comparing the emissions from the site with the carbon savings achieved by the wind farm, which displaces electricity generated from coal-fired, grid-mix, or fossil fuel-mix sources. Based on the projected annual energy output of the wind farm (192,851 MW yr-1) and its associated emissions, the potential annual CO2 emissions savings are estimated to be 179,357 tCO2 when compared to coal-fired electricity generation, 37,032 tCO2 compared to grid-mix electricity generation, and 78,881 tCO2 compared to fossil-fuel mix electricity generation.
- 3.6.2 Considering that the total estimated CO2 emissions for the Caerphilly local authority area in 2020 were 643,500 tonnes, the proposed wind farm could potentially save 27.8%, 5.7%, and 12.2% of these total emissions annually when compared to coal-fired, grid-mix, and fossil fuel-mix electricity generation, respectively.
- 3.6.3 The expected emissions payback time for the proposed 13 turbines and associated infrastructure is 0.6 years for coal-fired electricity, 2.5 years for grid-mix electricity, and 1.2 years for fossil fuel-mix electricity. The fossil fuel-mix scenario is considered the most likely. Therefore, the proposed wind farm would likely offset its carbon debt from manufacturing, construction, habitat impact, and decommissioning within 1.2 years if it replaces fossil fuel-based electricity generation. Subsequently, it is expected to provide 33.8 years of clean energy based on the maximum worst-case scenario.
- 3.6.4 Climate change is the greatest threat to biodiversity, causing severe disruptions to ecosystems and species worldwide. Rising temperatures, shifting weather patterns, and extreme weather events are altering habitats and upsetting natural balances. Many species struggle to adapt, leading to changes in distribution and migration, and mismatches in food sources. These impacts accelerate species extinction, reduce genetic diversity, and destabilise ecosystems, threatening natural services vital to human societies. Climate change intensifies other stressors like habitat destruction, pollution, and invasive species, compounding its devastating effects on biodiversity.
- 3.6.5 The proposed wind farm would contribute positively to this by reducing reliance on fossil fuels, thereby decreasing greenhouse gas emissions that drive climate change. By generating clean, renewable energy, the proposed wind farm would help mitigate climate change and its associated impacts on biodiversity. Additionally, the proposed wind farm can serve as a sustainable energy solution that minimises pollution and habitat destruction compared to fossil fuel electricity generation, further benefiting biodiversity.

4. Conclusions

- 4.1.1 This Green Infrastructure Statement and the ES supporting the Proposed Development demonstrates that the step-wise approach has been followed and the Proposed Development in that regard is in accordance with PPW.
- 4.1.2 The applicant has set out in detail how the step-wise approach has been followed through the iterative process of design layouts and consideration of alternatives, together with the avoidance of any statutory designated sites and sensitive ecological and landscape constraints which have been identified through the various survey and assessment work. The utilisation of the DECCA framework together with the step-wise approach has resulted in the identification of a net benefit for biodiversity. This can be secured through the proposed Habitat Management and Enhancement Plan.
- 4.1.3 The various positive enhancements that would result from the Proposed Development represent site specific interventions which will support the wider local, regional and indeed national objectives in seeking to enhance biodiversity and to create green infrastructure in Wales.
- 4.1.4 The Proposed Development will also directly contribute to regional and national targets to reduce carbon emissions and to help attain net zero targets.

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