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# 8. Biodiversity

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## 8.1 Introduction

8.1.1 This chapter presents the preliminary assessment of the likely significant effects of the Project with respect to Biodiversity (non-ornithology), including terrestrial and aquatic ecology. The assessment is based on information obtained to date. It should be read in conjunction with the Project description provided in **Chapter 4: Description of the Proposed Development** and with respect to relevant parts of the following chapters:

- **Chapter 6: Landscape;**
- **Chapter 9: Ornithology;**
- **Chapter 10: Water Environment; and**
- **Chapter 13: Noise.**

8.1.2 This chapter describes:

- The legislation, policy and technical guidance that has informed the assessment (**Section Error! Reference source not found.**);
- Consultation and engagement that has been undertaken and how comments from consultees relating to non-ornithology Biodiversity have been addressed (**Section Error! Reference source not found.**);
- The methods used for baseline data gathering (**Section Error! Reference source not found.**);
- Overall baseline (**Appendix 8A and Appendix 8B**);
- Embedded measures relevant to non-ornithology Biodiversity (**Section Error! Reference source not found.**);
- The scope of the assessment for non-ornithology Biodiversity (**Section Error! Reference source not found.**);
- The methods used for the assessment (**Section Error! Reference source not found.**);
- The assessment of non-ornithology Biodiversity effects (**Section Error! Reference source not found.**);
- Assessment of cumulative (inter-project) effects (**Section Error! Reference source not found.**);
- A summary of the significance conclusions (**Section 8.11**);
- Additional measures proposed (**Section Error! Reference source not found.**);
- Non-ornithology Biodiversity residual effects assessment (**Section Error! Reference source not found.**);

## Limitations and Assumptions

8.1.3 The vast majority of ecology surveys have been undertaken in suitable weather conditions at optimum times of year with reference to best practice guidance. All of the surveys have

been completed by suitably qualified surveyors and any limitations in the survey work are detailed in full in **Appendix 8A**. Where any limitations in the collation of baseline information are identified, a precautionary approach to the consideration of potentially significant effects and mitigation is adopted.

- 8.1.4 In summary, limitations to the field surveys include access restrictions to some buildings during the completion of internal and emergence surveys for bats.
- 8.1.5 Additionally, due to the evolution of the scheme design, turbine locations were changed (added, moved, and removed) as bat surveys progressed. Automated detectors were, however, deployed within those habitats of greatest value for a foraging/commuting bat assemblage (e.g., treelines) and thus are likely to have recorded greater activity compared to open habitat in which some turbines have been located. As such, it is considered that an assessment of impacts will have adopted a precautionary approach, based on data acquired from those habitats likely to support the greatest level of bat activity within the vicinity of each turbine.
- 8.1.6 Two automated detectors failed to record in October 2020. Given that activity was generally recorded as being low in the months of October across other detectors, and all detectors recorded without issue in October 2021, this is not considered to be a significant constraint. Additionally, one automated detector failed in June 2023 with a replacement detector positioned in July to compensate. This is therefore not considered to be a significant constraint.
- 8.1.7 During manual transect and automated bat activity surveys, the temperature at sunset dropped to below 10 degrees on a few nights; this was generally during the spring and autumn months when bat activity will generally be lower. Such natural fluctuations are typical, and, given that the majority of survey nights had temperatures of 10 degrees or above at sunset, the survey results are not considered to have been adversely impacted.
- 8.1.8 In respect of the above, with further details provided at **Appendix 8A**, there are no limitations relating to Biodiversity that affect the robustness of the assessment in respect of potential likely significant effects of the Project.

## 8.2 Relevant Legislation, Planning Policy and Technical Guidance

- 8.2.1 This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to Biodiversity. Further information on policies relevant to the Project is provided in **Chapter 5: Legislation and policy overview**.

### Legislation

- 8.2.2 A summary of the relevant legislation is given in Error! Reference source not found..

**Table 8.1 Legislation Relevant to the Biodiversity assessment.**

Technical Guidance Document	Context
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<b>The Conservation of Habitats and Species Regulations 2017 (as amended)<sup>1</sup></b>	The Habitat Regulations transpose the Habitats Directive <sup>2</sup> into English and Welsh law. The regulations provide for the designation and protection of European sites, the protection of certain species (referred to as European Protected Species or EPS) and the adaptation of planning and other controls for the protection of European sites
<b>The Environment (Wales) Act 2016<sup>3</sup></b>	The Act makes provisions within Wales for the planning and managing of natural resources at national and local level. Section 6 of the Act introduces the biodiversity and resilience of ecosystems duty whereby public authorities are required to seek to maintain and enhance biodiversity so far as it is consistent with the proper exercise of those functions. Section 7 of the Act introduces a list of living organisms and types of habitat which are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales, referred to as priority species and habitats.
<b>The Wildlife And Countryside Act 1981 (as amended) (WCA)<sup>4</sup></b>	This act consolidates and amends existing national legislation to implement the Bern Convention <sup>5</sup> . This piece of legislation remains the primary UK mechanism for statutory site designations (e.g., Sites of Special Scientific Interest (SSSI)) and the protection of individual species listed under Schedules 5 and 8 of the Act, each subject to varying levels of protection.
<b>Countryside &amp; Rights of Way Act 2000<sup>6</sup></b>	This act details further measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation.
<b>The Hedgerows Regulations 1997<sup>7</sup></b>	The Hedgerows Regulations is intended to protect important countryside hedges from damage or destruction.
<b>Protection of Badgers Act 1992<sup>8</sup></b>	The Protection of Badgers Act provides protection to badgers and their places of shelter (setts).

## Planning Policy

8.2.3 A summary of the relevant national and local planning policy is given in Error! Reference source not found..

**Table 8.2 Planning Policy Relevant to the Biodiversity Assessment.**

Technical Guidance Document	Context
<p><sup>1</sup> UK Government (2017). Conservation of Habitats and Species Regulations 2017 (“the Habitats Regulations”) has been amended by (inter alia) the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Online).</p>	
<p><sup>2</sup> Council Directive 92/43/EEC on the Conservation of natural habitats and wild flora and fauna, May 1992.</p>	
<p><sup>3</sup> UK Government (2016). The Environment (Wales) Act 2016. (Online). Available at: <a href="https://www.legislation.gov.uk/anaw/2016/3/contents/enacted">https://www.legislation.gov.uk/anaw/2016/3/contents/enacted</a> (Accessed 30 October 2023).</p>	
<p><sup>4</sup> UK Government (1981). The Wildlife and Countryside Act 1981 (as amended). (Online) Available at: <a href="https://www.legislation.gov.uk/ukpga/1981/69/contents">https://www.legislation.gov.uk/ukpga/1981/69/contents</a> (Accessed 30 October 2023).</p>	
<p><sup>5</sup> The Convention on the Conservation of European Wildlife and Natural Habitats, 1982. Available at: <a href="https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&amp;treaty-num=104">https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&amp;treaty-num=104</a> Accessed 30 October 2023).</p>	
<p><sup>6</sup> UK Government (2000). Countryside and Rights of Way Act 2000. (Online) Available at: <a href="https://www.legislation.gov.uk/ukpga/2000/37">https://www.legislation.gov.uk/ukpga/2000/37</a> (Accessed 30 October 2023).</p>	
<p><sup>7</sup> UK Government (1997). The Hedgerows Regulations 1997 (Online). Available at: <a href="https://www.legislation.gov.uk/uksi/1997/1160/contents/made">https://www.legislation.gov.uk/uksi/1997/1160/contents/made</a> (Accessed 30 October 2023).</p>	
<p><sup>8</sup> UK Government (1992). Protection of Badgers Act 1992. (Online) Available at: <a href="https://www.legislation.gov.uk/ukpga/1992/51/contents">https://www.legislation.gov.uk/ukpga/1992/51/contents</a> (Accessed 30 October 2023).</p>	

## National Planning Policy

### Future Wales: The National Plan 2040<sup>9</sup>

The Welsh national development framework sets the direction for development in Wales to 2040. Policy 9 – Resilient Ecological Networks and Green Infrastructure outlines measures to ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure.

### Planning Policy Wales (PPW) Edition 11, February 2021<sup>10</sup> - Revisions to Chapter 6 Distinctive and Natural Places, Adopted 11 October 2023<sup>11</sup>

Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government's objectives for Distinctive and Natural Places. Planning policy topics cover the historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water services, flooding and other environmental (surface and sub-surface) risks. In particular, recent revisions to Chapter 6 focus on green infrastructure; net benefit for biodiversity and the step-wise approach; protection for Sites of Special Scientific Interest; and trees and woodland. The revisions seek to clarify Wales' intentional, diverging approach to Biodiversity Net Gain in respect of the Environment Act 2021, with a focus instead on ecosystem resilience.

### PPW supplementary Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009)<sup>12</sup>

Technical Advice Note 5 (TAN5) supplements PPW and sets out statutory, protection-specific policies in relation to the protection of biodiversity and geological conservation through the planning system. Such policies include those receiving statutory protection under existing legislative provisions (as well as those sites, habitats and species outwith such protection), and aim to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.

## Local planning policy

### Caerphilly County Borough Council (CCBC) Local Development Plan up to 2021 (Adopted November 2010)<sup>13</sup>

Policies relating to biodiversity include Policy CW4 (Natural Heritage Protection) which states development proposals within, or in close proximity to sites designated as Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), Regionally Important Geological Sites (RIGS), Green Corridors, or Local Priority Habitats and Species, where proposals either: i Conserve and where appropriate enhance the ecological or geological importance of the designation, or ii Are such that the need for the development outweighs the ecological importance of the site, and where harm is minimised by mitigation measures and offset as far as practicable by compensation measures designed to ensure that there is no reduction in the overall value of the area or feature.

Of further pertinence is Policy CW5 (Protection of the Water Environment) whereby development proposals will only be permitted where: i )They do not have an unacceptable adverse impact upon the

<sup>9</sup> Welsh Government (2021). Future Wales: The National Plan 2040. (Online). Available at: <https://gov.wales/future-wales-national-plan-2040> (Accessed 30 October 2023).

<sup>10</sup> Welsh Government (2021) Planning Policy Wales, Edition 11, February 2021. (Online). Available at: <https://gov.wales/planning-policy-wales> (Accessed 30 October 2023).

<sup>11</sup> Revisions to PPW Chapter 6 came into effect 11 October 2023 following issue of ministerial letter reference MA/JJ/2512/23 to all Local Planning Authorities by the Welsh Government. Revised Chapter 6 can be found here: <https://www.gov.wales/planning-policy-wales-net-benefit-biodiversity-and-ecosystems-resilience> (Accessed 30 October 2023)

<sup>12</sup> Welsh Government, (2009). Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning. (Online) Available at: <https://gov.wales/technical-advice-note-tan-5-nature-conservation-and-planning> (Accessed 30 October 2023).

<sup>13</sup> CCBC (2010). Caerphilly County Borough Council Local Development Plan up to 2021. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx> [Accessed on 30 October 2023]

water environment, and ii) Where they would not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water).

Policy CW6 sets out the requirements in respect of trees, woodland and hedgerow protection whilst Policy NH3 sets out the specific SINC's requiring protection.

**CCBC Trees and Development SPG LDP 4 up to 2021 (Adopted January 2017)<sup>14</sup>**

SPG prepared to give greater guidance on how the following policies will be implemented: i) SP10 Conservation of Natural Heritage; and ii) CW6 Trees, Woodland and Hedgerow Protection. LDP4 seeks to ensure that trees are adequately addressed throughout the development process by seeking the protection and integration of trees into the design of new development from an early stage in the development process.

**Caerphilly Biodiversity Partnership Biodiversity Action Plan (2002) Volume 1<sup>15</sup> and Volume 2<sup>16</sup>**

The national strategy for biodiversity is delivered at local level via LBAP. CCBC LBAP is the driver to protect, enhance and manage the biodiversity resource, by setting out objectives, targets and actions for the conservation of biodiversity within Caerphilly.

## Technical Guidance

8.2.4 A summary of the technical guidance for Biodiversity is given in **Table 8.3**.

**Table 8.3 Technical Guidance Relevant to the Biodiversity Assessment.**

Technical Guidance Document	Context
<b>CIEEM (2022)<sup>17</sup> Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (version 1.2 updated April 2022)<sup>18</sup></b>	Provides practical advice for all professionals involved with ecological evaluation and assessment for proposed developments in terrestrial, freshwater, marine and coastal environments.
<b>Joint Nature Conservation Committee (2010) Handbook for Phase 1 Habitat Survey: A</b>	Presents a standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas. The Phase 1 habitat classification and associated field survey technique provides a relatively rapid system to record semi-natural vegetation and other wildlife habitats. Each habitat type/feature is defined by way of a brief description and is allocated a specific name, an alpha-numeric code, and unique mapping colour. The system has been widely used and

<sup>14</sup> Caerphilly County Borough Council (2017). Trees and Development Local Development Plan up to 2021. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/ldp4-trees-and-development.aspx> [Accessed on 30 October 2023]

<sup>15</sup> Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Overview and Habitat Statements Volume 1 Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx> [Accessed on 30 October 2023]

<sup>16</sup> Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Species Action Plans Volume 2. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx> [Accessed on 30 October 2023]

<sup>17</sup> The CIEEM guidelines were published in September 2018 and updated April 2022, hereafter referenced as CIEEM 2022.

<sup>18</sup> CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, freshwater, Coastal and Marine, Version 1.1 (online). Available at: <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/> Accessed 30 October 2023.



**Technique for Environmental Audit; JNCC, Peterborough.<sup>19</sup>**

continues to act as the standard 'Phase 1' technique for habitat survey across the UK.

**Bat Surveys for Professional Ecologists. Good Practice Guidelines (3rd Edition)<sup>20</sup>**

A reference guide for ecological consultants working on bat surveys. They are not a prescription for professional bat work and do not aim to override professional judgment and cannot be used to replace experience. Deviations from the methods described are acceptable providing professional rationale is clear and the ecologist is suitably qualified and experienced.

**Bats and Onshore Wind Turbines: Survey Assessment and Mitigation.<sup>21</sup>**

This guidance updates best practice information for developers and planners to ensure that onshore wind energy developments pose minimal risk to bats. The purpose of this document is to help planners, developers and ecological consultants to consider the potential effects of onshore wind energy developments on bats. The emphasis is on direct impacts such as collision mortality, but there is reference throughout to the need for a full impact assessment requiring a wider consideration of other (indirect) effects.

**Priority Habitats of Wales – A Technical Guide<sup>22</sup>**

This document provides the evidence base to support the key messages included in Chapter 3 of The State of Natural Resources Report, which presents a summary of the available evidence on the extent, condition and trends of natural resources and ecosystems in Wales.

## 8.3 Consultation and Engagement

### Overview

- 8.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 2.4 of Chapter 2: Approach to preparing the Environmental Statement.**

### Scoping Opinion

- 8.3.2 A Scoping Direction was issued by the Planning Environment Decisions Wales (PEDW), on behalf of the Welsh Ministers, on 02 December 2022. A summary of the relevant responses received in the Scoping Opinion in relation to Biodiversity and confirmation of how these have been addressed within the assessment to date is presented in **Table 8.4.**

<sup>19</sup>JNCC (2016) Handbook for Phase 1 habitat survey – a technique for environmental audit (JNCC, Peterborough). Available online at: <https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf> (accessed June 2023).

<sup>20</sup>Collins (ed.) (2016). Bat surveys for professional ecologists: Good practice guidelines. 3rd Edition.: Bat Conservation Trust; London.

<sup>21</sup>SNH, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2021). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation> Accessed June 2023.

<sup>22</sup>Jones PS, Stevens DP, Blackstock TH, Burrows CR, Howe EA. 2003. Priority Habitats of Wales – a Technical Guide. Bangor: Countryside Council for Wales.



- 8.3.3 **Appendix 8A** outlines the comments made in the Scoping Direction in relation to Biodiversity and how these have been addressed within this Draft ES.

**Table 8.4 Summary of EIA Scoping Direction Responses for Biodiversity**

Consultee	Consideration	How Addressed in this Draft ES
<b>Natural Resources Wales (NRW)</b>	NRW broadly agreed with the assessment methodology and scope of survey work. A response set out the standard requirements and guidance in respect to ecological surveys and impact assessment. NRW did, however, advise that an Extended Phase I survey is repeated during the summer months, considered more optimal for identifying the habitats present within the Site. NRW agreed with the scoping of great crested newt (GCN) into an assessment and set out the means of considering impacts upon this species, with an application to be supported by a detailed GCN Conservation Plan setting out the likely impacts of the proposals on GCN and all of the mitigation and/or compensation that will be carried out to offset the anticipated impacts.	In addition to an Extended Phase 1 Habitat Survey, fields comprising the Site were subject to a detailed botanical assessment during August 2021 and 2023, considered within the optimal season for survey of such habitats.  All surveys and preparation of an ES have been undertaken with reference to best practice survey guidelines and relevant industry guidance.
<b>Planning and Environment Decisions Wales (PEDW)</b>	In their response, PEDW has drawn attention to comments made by NRW relating to key habitats, survey types and locations, and the timings of these (ID.21) as well as specific comments in respect of survey effort for bats (ID.22). PEDW confirmed within the Scoping Direction their agreement with the general scoping approach proposed in respect of great crested newt (ID. 23).	As above.
<b>Caerphilly County Borough Council (CCBC)</b>	CCBC have confirmed their agreement with the scope of the survey work proposed, assessment methodology, and initial conclusions.	As above.

## 8.4 Data Gathering Methodology

- 8.4.1 All survey methodologies used within the assessment followed the published guidelines as accepted by the statutory and non-statutory agencies, including NRW and the

Chartered Institute for Ecology and Environmental Management (CIEEM). This Ecological Impact Assessment (EclA) follows the standard current guidance in place at the time of writing in 2023, as set out by the CIEEM and recommended by NRW.

- 8.4.2 The scope of the EclA has been determined by current ecological investigations of the Site and in respect of the Scoping Direction from PEDW. This process informed the identification of Important Ecological Features (IEFs) pertinent to the proposals, and the likely scope of potential impacts on these receptors.

## Study Area

- 8.4.3 The Site is located to the east of Newbridge/Trecelyn within CCBC, and comprises three parcels of land, referred to hereafter as the northern, central and southern parcels, with the northern parcel roughly centred at approximate Ordnance Survey National Grid Reference ST 235 982, the central parcel at ST 233 969 and the southern parcel at ST 228 963.
- 8.4.4 The Study Area comprises the following:
- The land within the Site boundary;
  - The search area for international, national and local designations;
  - The search area for protected/notable species; and
  - For the Wind Farm development, the field survey areas for each ecological feature covered during baseline data collection activities.

## Desk Study

- 8.4.5 The desk study comprises an important element of the baseline ecological appraisal of a site proposed for development, enabling the initial collation and review of contextual information such as designated sites and past records of protected and priority species<sup>23</sup>.
- 8.4.6 The desk study involved collating information from both statutory and non-statutory bodies, including:
- South-East Wales Biodiversity Records Centre (SEWBRc);
  - Aderyn (the Biodiversity Information and Reporting Database of Local Environmental Records Centres Wales); and
  - Multi-Agency Geographic Information for the Countryside (MAGIC)<sup>24</sup>.
- 8.4.7 The desk study was undertaken during April 2020 and updated in April 2022 and August 2023 with the following information requested:
- International statutory designations (30km radius);
  - National statutory designations (15km);
  - Non-statutory local sites (5km);

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<sup>23</sup> Species which are considered to be of key significance to sustain and improve biodiversity in Wales, as listed under Section 7 of the Environment (Wales) Act 2016.

<sup>24</sup> [www.magic.gov.uk](http://www.magic.gov.uk)

- Annex II bat species<sup>25</sup> records (6km radius); and
  - All other protected/notable species records (2km).
- 8.4.8 These search areas are considered sufficient to cover the potential Zones of Influence<sup>26</sup> of a standard residential development in relation to designated sites, habitats and species.
- 8.4.9 A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 8.5**.

**Table 8.5 Data Sources used to Inform the Biodiversity Assessment**

Organisation	Data source	Data Provided
<b>South East Wales Biological Records Centre (SEWBRcC)</b>	SEWBRcC via Aderyn	Species records on or within the vicinity of the study area including all bat species (6km radius), all other protected and priority species (2km radius), international designations (30km radius), National designations (15km radius) and local designations (5km radius).
<b>Multi-Agency Geographic Information for the Countryside (MAGIC)</b> ( <a href="http://www.magic.gov.uk">www.magic.gov.uk</a> )	MAGIC	International designations (30km radius), National designations (15km radius) and priority habitats (2km radius).

## Survey Work

- 8.4.10 A suite of surveys has been carried out within the Site, comprising the following surveys:
- Extended Phase 1 survey of the Site between 30 March and 02 April 2020;
  - Detailed botanical surveys<sup>27</sup> of the Site on 03 August 2021, updated on 22 and 23 August 2023;
  - Bat roost surveys: ground-level visual assessment of all mature trees located within a 130m buffer of each proposed turbine location during May 2022; ground-level and aerial tree inspections of those trees categorised as having moderate to high bat roost potential during July and August 2022; ground-level visual assessment of all suitable trees associated with the proposed access route on 22 August 2023; ground-level visual building assessments undertaken on 30 May 2022 of all built structures (where accessible) and present within a 280m buffer of each proposed turbine location as well as additional built structures located within the Site boundary; dusk emergence and/or

<sup>25</sup> Annex II species comprise those listed under Annex II of the Habitats Directive which occur in the UK and for which SACs are designated. The objectives of the National Site Network, which includes all SACs and SPAs, are to maintain or, where appropriate, restore such species to a favourable conservation status. In respect of bats, these include greater horseshoe bat, lesser horseshoe bat, barbastelle and Bechstein's bat.

<sup>26</sup> Zone of Influence - the areas and resources that may be affected by the proposed development.

<sup>27</sup> Detailed botanical surveys adopted DAFOR methodology whereby plant species are identified according to their abundance (Dominant, Abundant, Frequent, Occasional, or Rare). National Vegetation Classification (NVC) methodology was also utilised where appropriate to classify distinct plant communities and sub-communities supported with respect to their species composition and relative abundance, in addition to determining their botanical value and relative nature conservation value.

dawn re-entry surveys of built structures, where accessible and where assessed to have low to high bat roosting potential, undertaken in August and September 2022 and in July 2023;

- Bat foraging/commuting activity surveys: manual transects on six occasions between May and October 2020, on three occasions between April and June 2021, and on three occasions between June and August 2023; automated detector surveys carried out monthly between May and October 2020, between April and October 2021 and between June and August 2023; and deployment of a weather station between August 2020 and November 2021 and between June and August 2023;
- Badger (*Meles meles*) surveys in March and April 2020, further updated through additional observations made on subsequent survey visits to the Site thereafter during 2020, 2021 and 2023;
- Dormouse (*Muscardinus avellanarius*) surveys with tubes deployed in April 2020 and checked between May to November 2020 and April to November 2021; and
- Great crested newt (*Triturus cristatus*) surveys comprising: Habitat Suitability Index (HSI) assessment of waterbodies P1-P7 in April 2020 with waterbodies P1-P4, P6 and P7 subject to an update assessment on 16 June 2023; environmental DNA (eDNA) surveys of waterbodies P1-P4, P6 and P7 in April 2020 with a survey of waterbodies P5 and P6 undertaken on 19 April 2019 followed by update eDNA surveys of waterbodies P1, P4 and P7 on 16 June 2023; and population assessments of waterbodies P1, P2, P3, P4 and P7 between April and June 2021.

8.4.11 The methodology used for these surveys is further detailed in Section 2 of **Appendix 8A**.

## 8.5 Overall Baseline

8.5.1 This section summarises the baseline ecological conditions determined through the course of desk-based and field-based investigations. This section identifies and evaluates those ecological (non-ornithology) features/receptors that lie within the Site's potential Zol, and which are pertinent in the context of the Proposed Development. Further technical details are provided within **Appendix 8A**.

### Current Baseline

#### Site Context and Surrounding Habitats

8.5.2 The Site is located to the east of Newbridge/Trecelyn within CCBC, and comprises three parcels of land, referred to hereafter as the northern, central and southern parcels, with the northern parcel roughly centred at approximate Ordnance Survey National Grid Reference ST 235 982, the central parcel at ST 233 969 and the southern parcel at ST 228 963.

8.5.3 Broadly, the Site occupies the western part of the plateau of Mynydd Maen. It lies towards the southern end of a large north-south trending ridge of high land between the Afon Lwyd valley to the east and the mid-reach of the Afon Ebbw valley to the west. This ridge comprises a series of plateaux typically between 400m and 550m above sea level and is characterised by much unenclosed land grazed by sheep, and to a lesser extent cattle and horses. There is much evidence of historic industrial activity on the slopes of the ridge, particularly on the Avon Lwyd side.

- 8.5.4 The three parcels of land making up the Site comprise agricultural land parcels subject to sheep and cattle grazing, extending between the A472 to the north and Abercarn to the south, bound by coniferous woodland plantation and quarried areas.
- 8.5.5 Several public footpaths traverse the field parcels and their boundaries, in addition to unmetalled tracks. A number of waterbodies are also present in association with the northern and southern parcels, many of which are small, but which likely hold water in all but prolonged dry conditions.

## Designated Sites

- 8.5.6 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs). Local level statutory designations include Local Nature Reserves (LNRs).
- 8.5.7 No part of the Site is covered by any statutory designations. However, there are a number of such designations within the Site's potential ZoI, as further detailed in **Appendix 8A**.
- 8.5.8 Non-statutory designations are also commonly referred to in planning policies as 'local sites' and are typically considered to be of importance at a County level. In CCBC such designations are named Sites of Importance for Nature Conservation (SINCs). Additional designated sites which should be considered at this level include LNRs and Ancient Semi Natural Woodland (ASNW), where these are not covered by other designations.
- 8.5.9 There are no SINCs which overlap within the Site itself. However, a number are present within its immediate vicinity, as detailed in **Appendix 8A**.
- 8.5.10 Those designated sites that considered to be IEFs, and which are subject to further assessment, are set out in Table 8.6 below.

**Table 8.6 Statutory and Non-Statutory Designations within the Site's Potential Zone of Influence**

Designation	Approximate Distance from Site and Key Attributes	Nature Conservation Importance
<b>Local Sites</b>		
<b>Pwllgwinau, East of Newbridge SINC</b>	Comprises waterbody P7, located within the southern parcel, supporting amphibian populations including great crested newt, palmate newt ( <i>Lissotriton helveticus</i> ), smooth newt ( <i>Lissotriton vulgaris</i> ) and common frog ( <i>Rana temporaria</i> ).	Local
<b>Mynydd Maen, East of Newbridge SINC</b>	Adjacent to the northern and central parcels. Comprises a large upland common with extensive areas of acid grassland, heath and bracken ( <i>Pteridium aquilinum</i> ) with a number of indicator species. Locally significant bryophyte species also present. Secondary features include rock outcrops/dry stone walls, marshy grassland, semi-improved acid grassland aquatic features.	Local

<b>Coed Cil-Lonydd, East of Newbridge SINC</b>	Adjacent to the northern parcel. This SINC follows the course of two branches of the wooded Nant Gawni stream and includes two adjoining woodland blocks of former ancient woodland on the steep valley sides. Adjoining woodland SINC areas support a mix of semi-natural woodland.	Local
<b>Gwydon Valley Woodlands, Abercarn SINC</b>	Adjacent to the central and southern parcels. A large area of forestry plantation on the site of former ancient woodland. Supports large beech ( <i>Fagus sylvatica</i> ) trees and areas of larch ( <i>Larix</i> sp.) plantation. Rock outcrops/dry stone walls and streams present.	Local
<b>Cwm Hafod-Fach Woodlands, North of Abercarn SINC</b>	Adjacent to the southern parcel. An area of mixed woodland on sloping valley-sides surrounding a working quarry. Most of the woodland is classed as semi-natural or cleared/replanted ancient woodland. Acid grassland and heath occurs locally in open areas in the upper parts of the valley.	Local
<b>Craig Gwent Wood Ancient Woodland SINC</b>	Adjacent to the northern and central parcels. Comprises a large upland common with extensive areas of acid grassland, heath and bracken with a number of indicator species. Locally significant bryophyte species also present. Secondary features include rock outcrops/dry stone walls, marshy grassland, semi-improved acid grassland and aquatic features.	Local
<b>River Ebbw SINC</b>	734m west at its closest point, but potentially hydrologically connected through a seasonally wet ditch in the northern parcel and from any contaminated run off from all parcels.	Local

## Habitats

- 8.5.11 The distribution of different habitat types within and adjacent to the Site is described in detail within **Appendix 8A**.
- 8.5.12 Those habitat types considered likely to be impacted by the Proposed Development which require further consideration are listed in **Table 8.7** below.

**Table 8.7 Potential IEFs (habitats) Present within the Site's potential Zone of Influence**

Potential IEF	Approximate Distance from Site and Key Attributes	Nature Conservation Importance
<b>Plantation Woodland</b>	Coniferous woodland block relatively uniform in age and structure.	Site
<b>Treelines and Hedgerows</b>	Priority habitat. Where present, hedgerows are predominantly defunct and species poor. Field boundaries across agricultural land otherwise defined by lines of semi-mature and mature trees dominated by beech.	Local



<b>Broadleaved Woodland and Scrub</b>	Priority habitat. Low distinctiveness and limited in extent.	Site
<b>Dense/Scattered Scrub</b>	Low distinctiveness and limited in extent.	Site
<b>Unimproved Acid Grassland</b>	Priority habitat and species-rich but very restricted in extent, occurs within larger agriculturally improved fields and subject to unsympathetic management.	Site-local
<b>Semi-improved Neutral Grassland</b>	Relatively diverse but limited in extent.	Site
<b>Poor Semi-improved Grassland</b>	Species-poor grassland, low distinctiveness.	Site
<b>Improved Grassland</b>	Species-poor grassland, low distinctiveness.	Site
<b>Bracken</b>	Low distinctiveness and limited in extent.	Negligible
<b>Tall Ruderal Vegetation</b>	Low distinctiveness and limited in extent.	Negligible
<b>Aquatic Features</b>	Priority habitat. Two waterbodies P2 and P7 present on-site; a further seven situated within 500m of the parcel boundaries.	Local
<b>Built Structures</b>	Residential properties and farm buildings present on-site.	Negligible

## Protected and/or Notable Species

- 8.5.13 Details of the surveys undertaken for protected species and their distributions within the Site are described in detail in **Appendix 8A**.
- 8.5.14 Pertinent desk study results for those species considered likely to be impacted by the Proposed Development which require further consideration are listed in **Table 8.8** below.

**Table 8.8 Potential IEFs (species) within the Site's Potential Zone of Influence**

<b>Species (excluding birds)</b>	<b>Desk Study Records Pertinent to the Site (Undertaken April 2020 and updated in April 2022 and August 2023)</b>	<b>Nature Conservation Importance</b>
<b>Bats</b>	The desk study returned records from 2003 for bat roosts relating to Natterer's bat ( <i>Myotis nattereri</i> ) and long-eared bat ( <i>Plecotus</i> sp.) to the immediate south of the northern parcel within Blaengawney Farm. A maternity roost for long-eared bat was also returned from 2021, located c.356m to the west of the southern parcel. Additional records returned within the vicinity of the Site relate to the built-up areas of Crumlin, Newbridge, Abercarn and Cwmcarn surrounding the Site. In respect of Annex II species, a number of records were returned for greater horseshoe bat and lesser horseshoe bat, the closest roost being a day roost of a single greater horseshoe bat	Local



located c.1.4km west of the Site recorded in 2022. In respect of barbastelle bat, only a single record was returned, located c.1.8km to the west of the Site and recorded in 2021. No records for Bechstein's bat were returned, however. Other roost records relating to common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), and lesser horseshoe, long-eared, noctule and myotis (*Myotis* spp.) bats were also returned.

<b>Badger</b>	The desk study returned several records of setts within woodland surrounding the Site, the closest records relating to setts situated c.115m to the west of the southern parcel (the southern parcel), recorded in 2007, and c.190m to the south-west of the northern parcel, recorded in 2013. More recent records relate to deceased individuals found on the A472 Hafodyrynys Road to the north of the southern parcel in 2017 and 2019.	Negligible
<b>Dormouse</b>	An unconfirmed record was returned circa 660m to the south of the Site in 2003, and in 2022 a dormouse nest was recorded 1.6km to the north of the Site. Habitat connectivity between the Site and these recorded locations is limited, whilst habitats supported by the Site are generally assessed as being sub-optimal for this species.	Negligible
<b>Great Crested Newt</b>	Numerous records for this species were returned during the desk study, including records relating to the northern and southern parcels. In respect of the northern parcel, a record was returned in relation to waterbody P1 in 2010 and waterbody P3 in 2005, confirming the presence of adult male and female great crested newts and their eggs within each of these waterbodies. In respect of the southern parcel, multiple records for great crested newt were returned for waterbody P7, including a record from 1987 confirming the presence of two adults, efts in 1998 and eggs in 2005. A recorded sighting of two adult male great crested newt individuals in 2005 was also returned beyond 500m from the Site, relating to an area of woodland located to the south of the northern parcel and east of the central and southern parcels.	Local
<b>Common Reptiles</b>	A number of records for common lizard ( <i>Zootoca vivipara</i> ) were returned, including two records from 1991 relating to a field c.380m to the south of the southern parcel. Additional records from 2002 and 2007 were also returned in relation to this parcel, located c.700m and 1.2km to the south and west respectively. A further record for common lizard was also returned in 2007, located c.1.8km to the north-west of the northern parcel. A number of records of slow-worm ( <i>Anguis fragilis</i> ) were also returned within close proximity of the Site, c.350-500m to the west of the Site, with records dating between 2006 and 2014. More recent records of slow worm were returned from 2022: two located 1.5km to the west and two 2.1km to the south. A single record for adder ( <i>Vipera berus</i> ) was also returned, relating to a sighting of three adult females and two juveniles along	Local

Forest Drive, Cwmcarn, in 2021, located c.2.2km to the south of the Site. No records for grass snake (*Natrix natrix helvetica*) were returned, however.

## Bats

### Activity

- 8.5.15 A total of nine bat species/species groups (*Myotis* and *Plecotus* species were not always identified to species level) were recorded foraging and/or commuting across the study area between May and October 2020, April and October 2021 and June and August 2023, including the following species: common pipistrelle, soprano pipistrelle, long-eared bat species, myotis bat species, noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*), and lesser horseshoe bat. In addition, greater horseshoe bat and Nathusius' pipistrelle (*Pipistrellus nathusii*) were also recorded, albeit rarely, during the automated detectors surveys in 2020 and 2021 respectively.
- 8.5.16 Species diversity was broadly consistent between the current proposed locations for wind turbines. Species diversity and activity was highest during the summer months, with lower diversity and activity in spring and autumn.
- 8.5.17 In respect of 2020 data, on average, c.750 bat registrations were recorded per automated detector per month deployed, with levels of activity greatest during the month of August (1,312 registrations per detector on average), followed by: June (1,177 registrations), July (1,155 registrations) May (501 registrations), September (284 registrations), and October (70 registrations).
- 8.5.18 The vast majority of registrations recorded by the automated detectors relate to common pipistrelle (91.4%), followed by soprano pipistrelle (2.96%) and *Myotis* bat species (2.1%). Big bats, including noctule and serotine, made up a further 3.2% of registrations, with long-eared bat (0.23%), lesser horseshoe bat (0.08%) and greater horseshoe bat (0.03%) otherwise rarely recorded.
- 8.5.19 In respect of the 2020 walked transects, common pipistrelle also dominated bat activity, comprising 86% of bat activity recorded, followed by soprano pipistrelle, (6.3%), *Myotis* bat species (4.1%) and long-eared bat (3.4%). Remaining calls related to lesser horseshoe (0.1%) and noctule (0.1%), with only one pass recorded in June and July respectively, in association with the northern transect route walked across the northern parcel.
- 8.5.20 In respect of 2021 data, on average, only c.327 bat registrations were recorded per automated detector per month deployed, with levels of activity greatest during the month of August (583 registrations per detector on average), followed by June (538 registrations), September (441 registrations), July (434 registrations), October (146 registrations), May (124 registrations) and April (24 registrations).
- 8.5.21 The vast majority of registrations recorded by the automated detectors relate to common pipistrelle (86%), followed by soprano pipistrelle (9.3%) and *Myotis* bat species (2.9%). Big bats, including noctule and serotine, made up a further 1.45% of registrations, with long-eared bat (0.23%), lesser horseshoe bat (0.1%) and Nathusius' pipistrelle (0.02%) otherwise rarely recorded. In respect of Nathusius' pipistrelle, only a single registration

was recorded by two automated detectors (locations 3 and 4) during the July 2021 deployment.

- 8.5.22 In respect of the 2021 walked transects, common pipistrelle also dominated bat activity, comprising 91% of bat activity recorded. The remainder of the activity recorded relate to soprano pipistrelle, (6.3%) and Myotis bat species (2.7%) only, with no other bat species recorded during the surveys.
- 8.5.23 In respect of 2023 data, on average, c.1195 bat registrations were recorded per automated detector per month deployed, with levels of activity greatest during the month of August (1672 registrations per detector on average), followed by June (1338 registrations) and July (574 registrations).
- 8.5.24 The vast majority of registrations recorded by the automated detectors relate to common pipistrelle (77.3%), followed by soprano pipistrelle (17.7%) and Myotis bat species (4.4%). Long-eared bat (0.17%), serotine (0.15%), noctule (0.13%), lesser horseshoe bat (0.05%) and greater horseshoe bat (0.05%) were otherwise rarely recorded.
- 8.5.25 In respect of the 2023 walked transects, common pipistrelle also dominated bat activity, comprising 86% of bat activity recorded. The remainder of the activity recorded primarily relate to soprano pipistrelle, (8.4%), noctule (2.9%) and Myotis bat species (1.1%). Occasional passes by Nathusius' pipistrelle (0.64%; four passes recorded during the June survey), serotine (0.64%; four passes recorded during the August survey) and greater horseshoe bat (0.16%; single pass recorded during the August survey) were also recorded during the surveys.

### *Ecobat (Collision Risk) Analysis*

- 8.5.26 A collision risk analysis based on all bat activity data collated for the Site has not possible to date. Ecobat computer software currently remains offline for essential maintenance for the foreseeable future whilst the Mammal Society reviews the next phase of delivery of this service. NatureScot and Natural England are aware of the ongoing maintenance issues, with Ecobat reports remaining unavailable at this time<sup>28</sup>.

### Roosting

- 8.5.27 In respect of roosting bats, detailed tree inspections undertaken between May 2022 and August 2022 of all suitable trees located within the survey radius (130m) of each proposed turbine location (refer to **Appendix 8A**) did not confirm the presence of any bat tree roosts. However, 14 trees on-site have high potential to support roosting bats, whilst a further 59 trees have moderate potential, and 153 trees have low potential.
- 8.5.28 With respect to trees within the vicinity of the proposed access route to be subject to improvement works, an initial ground level assessment undertaken on 07 June 2023 identified six trees/tree groups (T257, G266, G267, G268, G277 and T283) with low suitability to support roosting bats.
- 8.5.29 With regards to built structures, a visual assessment of eight built structures associated with the southern parcel completed on 30 May 2022 confirmed three structures (B1, B2 and B3) to have moderate potential to support roosting bats whilst one structure (B4) is considered to have low potential. The remaining four structures (B5, B6, B7 and B8) were considered to be of negligible potential to support roosting bats.
- 8.5.30 Dusk emergence surveys undertaken of buildings B1-B4 confirmed the presence of an occasional day roost for low numbers of common pipistrelle bats in association with B1

<sup>28</sup> Personal communication received from the Mammal Society, 11 October 2023. The current status of Ecobat can be found here: <https://www.mammal.org.uk/science-research/ecostat/ecobat/>

and B3, during the September 2022 survey. However, no bat emergence was recorded for either of these buildings during the August 2022 or July 2023 surveys. No bats were recorded emerging from buildings B2 and B4 however, with no evidence of bats or their signs of use recorded during an endoscope survey of B4. As such, bat roosts are presumed absent from these buildings.

## Badger

- 8.5.31 No evidence of badger activity or their setts were recorded during the initial survey nor on subsequent survey visits to the Site throughout 2020, 2021 and 2022.
- 8.5.32 Based upon the findings to date, badgers are assessed to be likely absent from the Site and can be scoped out from further assessment.

## Dormouse

- 8.5.33 Dormouse surveys conducted between May 2020 and November 2021 found no evidence of dormice. In addition, no evidence of wood mouse (*Apodemus sylvaticus*), evidence of their activity (including nests and food caches), or signs of other mammal usage was recorded during the surveys.
- 8.5.34 Based upon the findings to date, dormouse is likely absent from the Site and is therefore scoped out from further assessment.

## Great Crested Newt

- 8.5.35 Two waterbodies occur within the Site, whilst a further seven waterbodies are present within a 500m of the Site boundary. The habitat suitability assessment undertaken in 2020 and updated in 2023 confirmed waterbodies P1, P6 and P7 to be of 'average' suitability, waterbody P5 to be of 'below average' suitability and waterbodies P2, P3 and P4 to be of 'poor' suitability.
- 8.5.36 Waterbodies P1, P2, P3 and P4 associated with the northern parcel and waterbody P7 located within the southern parcel tested positive for great crested newt eDNA following the April 2020 surveys. Remaining waterbody P5 (surveyed in April 2021) and waterbody P6 (surveyed in April 2020 and subject to an update survey in April 2021) tested negative for great crested newt eDNA however, confirming likely absence of this species for these waterbodies.
- 8.5.37 Update water sampling surveys of waterbodies P1 and P7 in June 2023 reconfirmed great crested newt presence; however, no evidence of great crested newt eDNA was recorded for waterbody P4 during the 2023 update survey. Whilst no access to waterbodies P2, P3, P5, P6, P8 or P9 was possible during the 2023 update surveys, continued great crested newt presence is assumed for waterbodies P2 and P3. Likely continued absence of this species is otherwise assumed for waterbodies P5 and P6. Intermittent usage by great crested newt of P4 is, however, assumed.
- 8.5.38 With respect to detailed population assessment completed during 2021, great crested newt presence was confirmed within waterbodies P1-P4 associated with the northern parcel and within waterbody P7 located within the southern parcel. The highest count of adult great crested newt individuals per waterbody on any given survey was 13, recorded within waterbody P1 located to the immediate north of the northern parcel, indicating presence of a medium-size population albeit at the lower end of this scale. The maximum count for great crested newt at all other waterbodies surveyed was as follows: five at P2; six at P3, one at P4 and three at P7.

- 8.5.39 In respect of waterbodies P1, P2, P3 and P7, both adult male and female great crested newt individuals were recorded during the surveys, confirming these waterbodies to likely be breeding ponds. Whilst only a maximum of one female great crested newt was recorded within waterbody P4, given its proximity to waterbodies P2 and P3, this waterbody also has potential to support a breeding population in future.
- 8.5.40 Waterbodies P2, P3 and P4 are clustered, occurring between 65m and 170m from each other, with waterbody P1 located c.700m to the north-west of this cluster at its closest point. It is therefore considered that those waterbodies associated with the northern parcel and their surrounding habitats currently support a breeding metapopulation which is medium-sized, albeit at the lower end of this scale. In respect of the small great crested newt population supported by waterbody P7, this waterbody is situated over 1.7km away, and thus may represent a separate great crested newt population within the wider landscape.
- 8.5.41 The medium-sized metapopulation of great crested newt associated with the northern parcel and a small population associated with the southern parcel are therefore considered to be of Local level importance.

## Reptiles

- 8.5.42 During the course of the ecological surveys undertaken across the Site, occasional, incidental sightings of common lizard were also recorded in association with the southern parcel, albeit beyond this parcel's boundaries. The Site therefore has potential to support a low population of common lizard, whilst the presence of other common species, particularly slow worm and grass snake should not be ruled out. Given their relative widespread distribution across south Wales more generally, common reptiles are considered to be of importance at the Local level only.

## Future Baseline

- 8.5.43 Should the Proposed Development not proceed, it is considered that land practices would likely remain the **same**, with the majority of the grassland areas continuing to be grazed. The future baseline is therefore unlikely to be markedly different from the current baseline in respect of habitat types and species assemblages supported.
- 8.5.44 In respect of climate change, predicted changes to temperature and precipitation would likely change the landscape around us over time in a number of ways. However, it is unlikely that such subtle changes would lead to wholesale change to the future ecology baseline within the lifetime of the Proposed Development. Changes could see certain habitats and species becoming more prevalent or declining as their ranges contract or expand. However, given that those species identified for the Site are generally widespread, and that the survey area is not near the edge of any of their ranges, the projected change in temperature and precipitation is not anticipated to result in any significant changes to IEFs.

## 8.6 Embedded Measures

- 8.6.1 A range of environmental measures have been embedded into the Proposed Development as outlined in **Section 3.4**.

## Construction Environmental Management Plan

- 8.6.2 A Construction Environmental Management Plan (CEMP) supports this Submission and will be implemented during the entirety of the construction stage to ensure appropriate



management and operational systems are in place to avoid or minimise adverse pollution effects.

- 8.6.3 The CEMP can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission. An Outline CEMP forms part of this Draft ES.

## Ecological Construction Method Statement

- 8.6.4 An Ecological Construction Method Statement (ECMS) will be prepared which will set out in detail the measures to be implemented to protect IEFs during the construction phase of the Proposed Development. It is proposed that the methodologies prescribed within the ECMS will be overseen by an appointed Ecological Clerk of Works (ECoW), whose scope and remit will be set out within the ECMS. The ECMS will also clearly identify the responsibilities of key personnel including the Site manager(s) and ECoW. This document will also cross reference with the CEMP, where relevant.
- 8.6.5 The ECMS and appointment of the ECoW can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

## Landscape and Ecological Management Plan

- 8.6.6 A Landscape and Ecological Management Plan (LEMP) will be prepared for the Proposed Development to ensure the appropriate management and maintenance of all retained and newly created habitats/features proposed over the lifetime of the development. The LEMP will set out in the detail those ecological management prescriptions for defined management compartments to be retained and/or created, in addition to the monitoring of biophysical changes to sensitive habitats including: terrestrial succession and scrub encroachment within retained, enhanced and newly created habitats; botanical monitoring of sensitive habitats retained, translocated and restored; the monitoring of new habitats/features installed/created across the Site; and any additional monitoring and remedial action required.
- 8.6.7 The LEMP can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

## Collision Mitigation Monitoring Strategy (CMMS)

- 8.6.8 A detailed Collision Mitigation Monitoring Strategy (CMMS) will be prepared, which will set out in detail the measures to be implemented to reduce the impacts on bats from killing due to barotrauma. The CMMS will set out the detailed mitigation measures to be employed, including feathering of the blade, curtailment for specific turbines at specific times of year (e.g., curtailment during the autumn months when there are peaks in bat activity from high collision risk species) and/or during specific weather conditions (e.g., during warm nights with little wind, which are considered favourable conditions for bats). Monitoring details will also be set out, to include the level and duration of monitoring required (such as acoustic monitoring and carcass searches). The CMMS will allow for adaptation of the mitigation strategy if the monitoring surveys find that mitigation measures are not preventing bat deaths and will allow for additional curtailment measures to be included to prevent such fatalities.
- 8.6.9 The CMMS can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.
- 8.6.10 **Table 8.9** outlines how these embedded measures will influence the Biodiversity assessment.

**Table 8.9 Summary of the Embedded Environmental Measures**

Receptor	Potential Changes and Effects	Embedded Measures	Compliance Mechanism
<b>Construction</b>			
<b>Locally Designated Sites: Mynydd Maen, East of Newbridge SINC, Coed Cil-Lonydd, East of Newbridge SINC, Gwydon Valley Woodlands, Abercarn SINC, Cwm Hafod-Fach Woodlands, North of Abercarn SINC, Craig Gwent Wood Ancient Woodland SINC, River Ebbw SINC</b>	Impacts upon Mynydd Maen, East of Newbridge SINC arising from habitat loss of associated habitats present within the Site as a result of construction of the access route and turbines.	Habitats that are subject to temporary loss to be reinstated at the earliest opportunity and enhanced where possible.	ECMS/CEMP/LEMP
	Impacts upon Coed Cil-Lonydd, East of Newbridge SINC, Gwydon Valley Woodlands, Abercarn SINC, Cwm Hafod-Fach Woodlands, and North of Abercarn SINC, arising from damage to/degradation of associated habitats given proximity to the Site.	Habitats that are permanently lost to be offset through habitat creation and enhancements to retained habitats within the wider Site.	
	Impacts upon River Ebbw SINC arising from polluted surface water runoff from construction.	Protective fencing to be installed around retained habitat features as necessary.  Construction to be implemented in accordance with pollution prevention guidelines.	
<b>Habitats</b>	Direct and indirect impacts upon sensitive habitats from construction of turbines and associated infrastructure, including direct loss of habitat, and indirect loss arising from degradation/disturbance impacts, dust deposition, and polluted run-off.	Habitats that are subject to temporary loss to be reinstated at the earliest opportunity and enhanced where possible.  Habitats that are permanently lost to be offset through habitat creation and enhancements to retained habitats within the wider Site.  Protective fencing to be installed around retained habitat features as necessary.	ECMS/LEMP



		Construction to be implemented in accordance with pollution prevention guidelines	
<b>Commuting, Foraging and Roosting Bats</b>	Loss of roosting, foraging and commuting habitats to facilitate construction of turbines. Potential disturbance to foraging, commuting and roosting bats as a result of use of night-time lighting during construction works.	<p>Turbines sited away from nearby roosts.</p> <p>Micro-siting of turbines as far as possible to minimise tree loss and impacts to Root Protection Areas (RPAs).</p> <p>Pre-commencement checks of trees with bat potential in vicinity of turbines to confirm continued absence of roosts.</p> <p>Implementation of mitigation measures prior to felling of trees with confirmed bat roost potential (or in accordance with an NRW EPS Development Licence where bat roosts are confirmed).</p> <p>Habitats that are permanently lost to be offset through habitat creation and enhancements to retained habitats within the wider Site.</p> <p>In respect of local bat populations utilising the Site, construction works to be carried out during daylight hours, ideally over winter when bats will be in hibernation, and/or implementation of a sensitive lighting regime should works need to be carried out at night.</p>	ECMS/CEMP
<b>Great Crested Newt</b>	<p>Potential killing/injury of individuals during construction phase from habitat clearance and construction traffic.</p> <p>Potential for direct and indirect impacts upon habitats of value for</p>	Where necessary, GCN population to be subject to translocation/displacement from the construction footprint to a suitable receptor site under an EPS Development Licence from NRW to prevent killing or injury. Receptor site to be	ECMS/CEMP/LEMP/NRW EPS Development Licence

	breeding, foraging and hibernation from construction of turbine locations and associated infrastructure, including direct loss of habitat, and indirect loss arising polluted run-off to waterbodies.	<p>subject to appropriate habitat enhancements prior to translocation/displacement.</p> <p>GCN habitats that are subject to temporary loss to be reinstated at the earliest opportunity and enhanced where possible.</p> <p>GCN habitats that are permanently lost to be offset through habitat creation and enhancements to retained habitats within the wider Site.</p> <p>Construction to be implemented in accordance with pollution prevention guidelines.</p>	
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<b>Common Reptiles</b>	Potential killing/injury of common reptiles during construction phase from habitat clearance and construction traffic.	Suitable reptile habitat to be subject to a habitat manipulation exercise prior to construction works commencing. Any reptiles found to be moved to retained habitats away from the working corridors, to prevent killing or injury. The construction areas to be retained as unsuitable habitat for the duration of the construction works.	ECMS/CEMP
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**Operation**

<b>Locally Designated Sites</b>	No additional impacts during the operational phase.	N/A	N/A
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<b>Habitats</b>	No additional impacts during the operational phase.	N/A	N/A
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<b>Commuting and Foraging Bats</b>	Potential killing/injury by turbines within close proximity to commuting and foraging routes for bats.	<p>Minimum 50m stand-off from turbine blade tip to be maintained in respect of existing bat habitat and new tree planting.</p> <p>Where not feasible in respect of Turbine 2, 3 and 4, micro-siting of turbines to minimise impacts to trees</p>	ECMS/LEMP/Collision Mitigation Monitoring Strategy (CMMS)
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		and their RPAs will be undertaken.	
		Curtailment to apply during the main bat roost season when weather conditions are considered favourable to bats, or else bat habitat features to be subject to removal with sufficient compensatory planting in place.	
		Feathering of blades during idling.	
<b>Roosting Bats</b>	Potential killing/injury by turbines within close proximity to bat roosts.	Pre-commencement checks of trees with bat potential in vicinity of turbines to confirm continued absence of roosts.  Implementation of mitigation measures prior to felling of trees with confirmed bat roost potential (or in accordance with an NRW EPS Development Licence where bat roosts are confirmed).	ECMS/LEMP/CMMS/NRW EPS Development Licence
<b>Great Crested Newt</b>	No additional impacts during the operational phase.	N/A	N/A
<b>Common Reptiles</b>	No additional impacts during the operational phase.	N/A	N/A

## 8.7 Scope of the Assessment

### Overview

- 8.7.1 Best practice guidelines for EclA (CIEEM 2019) recognise that not every species that is potentially present at a site or affected by a development can be assessed. The guidelines advocate that the EclA process includes an initial ‘scoping stage’ to identify ecological features that are unlikely or likely to be significantly affected by the Proposed Development, thereby allowing the assessment to focus on those ecological features that are pertinent to the Proposed Development and planning decision. This process is informed by the site investigations and consultation with key stakeholders, including the formal EIA Scoping response. This section summarises the approach to, and outcomes of, the EclA scoping stage, including those ecological (non-ornithology) features that have been scoped into or out of the assessment.

## The Proposed Development

- 8.7.2 The Proposed Development is described in full in **Chapter 4 Project Description**. It comprises a wind farm consisting of up to four wind turbines, each with a three-bladed rotor with a diameter of up to 117m, a hub height of up to 84m and maximum height to blade tip of 145m.
- 8.7.3 The application also includes associated infrastructure, including: access tracks, crane pads and cabling, temporary site offices and construction compound.
- 8.7.4 The wind farm will have an operational life of 30 years. For the purposes of this assessment, it is assumed that the wind farm would be decommissioned at this point, though there is also the option for the developer to apply for an extension or upgrades in technology.

## Spatial Scope

- 8.7.5 The spatial scope of the assessment of biodiversity covers the area of the Proposed Development contained within the red line boundary, together with the Zols that have formed the basis of the study area described in **Section** Error! Reference source not found.. This has been determined through a review of the baseline ecology conditions relative to the project in the context of the proposed activities. It has also been informed by liaison with consultees and other specialists involved in assessing the effects in other disciplines of the project, as considered within this Draft ES and other supporting documentation.
- 8.7.6 The potential impacts of the Proposed Development are largely confined to the turbine locations, access route and grid connection corridor, although given the continuity of habitats outside the Site, consideration has also been given to the following effects upon habitats and species extending beyond these areas which could arise as a result of the construction of the Proposed Development, in the absence of mitigation:
- Disturbance to populations from noise, visual and human disturbance;
  - Fragmentation of dispersal corridors used by adjacent populations;
  - Direct habitat loss, damage and degradation due to land take upon habitats and species;
  - Disruption to habitats or populations within range of dust deposition;
  - Disturbance to populations within dispersal distance of the Site; and
  - Pollution to groundwater and surface water flows.
- 8.7.7 As such, the scope of the desk study and survey areas reflects the sensitivity and value of potential ecological receptors, extending to 30km and 2km from the Survey Boundary respectively. The spatial scope of the surveys was subject to small variations between the year one, two and year three surveys due to minor changes to the number and potential turbine and infrastructure locations.

## Temporal Scope

- 8.7.8 The temporal scope of the assessment of biodiversity is consistent with the period over which the Project would be carried out as set out in **Chapter 4**. This includes an anticipated 24-month construction period and 30-year operation. Effects during decommissioning have not been specifically assessed at this stage; however, it is considered that they will be similar or no worse than construction effects.

## Construction Phase

- 8.7.9 Generalised effects which could arise as a result of the construction of the Proposed Development in the absence of mitigation include the following:
- Effects of direct habitat loss, damage and degradation due to land take upon habitats and species;
  - Impacts of noise, light and human disturbance to species; and
  - Pollution of groundwater and surface water flows, as described further in **Chapter 10: Water Environment**.

## Operational Phase

- 8.7.10 Generalised effects which could arise as a result of the operation of the Proposed Development, in the absence of mitigation, include the following:
- Effects of light and noise/visual/human disturbance to habitats and species;
  - Increased risk of collision to species arising from wind turbine operation; and
  - Alteration of surface water and groundwater flow quality and quantity, as described further in **Chapter 10: Water Environment**.

## Decommissioning

- 8.7.11 Generalised effects which could arise as a result of decommissioning of the Proposed Development in the absence of mitigation include the following:
- Effects of additional habitat loss, damage and degradation due to land take upon habitats and species;
  - Impacts of noise, light and human disturbance to species; and
  - Increased risk of collision to species arising from increased traffic movements.

## Potential Receptors

- 8.7.12 The principal Biodiversity receptors that have been identified as being potentially subject to effects are summarised in **Table 8.10**.

**Table 8.10 Biodiversity Receptors subject to Potential Effects**

Receptor	Reason for Consideration
<b>Local Sites</b>	
<b>SINCs within the Site</b>	Those SINCs situated within the Site and to be affected by construction of the turbines and associated infrastructure include: Mynydd Maen, East of Newbridge SINC. Other non-statutory designations adjacent to the Site or for which there are pathways along which impacts may arise include: Pwllgwinau, East of Newbridge SINC, Coed Cil-Lonydd, East of Newbridge SINC, Gwydon Valley Woodlands, Abercarn SINC, Cwm Hafod-Fach Woodlands, North of Abercarn SINC and Craig Gwent Wood Ancient Woodland SINC.

<b>Habitats</b>	
<b>Plantation Woodland</b>	Present within the Site.
<b>Treelines and Hedgerows</b>	Present within the Site, access route and turbine locations.
<b>Broadleaved Woodland and Scrub</b>	Present within the Site.
<b>Dense/Scattered Scrub</b>	Present within the Site.
<b>Unimproved Acid Grassland</b>	Present within the Site.
<b>Semi-improved Neutral Grassland</b>	Present within the Site.
<b>Poor Semi-improved Grassland</b>	Present within the Site, access route and turbine locations.
<b>Improved Grassland</b>	Present within the Site, access route and turbine locations.
<b>Bracken</b>	Present within the Site.
<b>Tall Ruderal Vegetation</b>	Present within the Site and access route.
<b>Aquatic Features</b>	Present within the Site.
<b>Built Structures</b>	Present within the main site.
<b>Protected Species</b>	
<b>Commuting and Foraging Bats</b>	Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared bat species, myotis species, noctule, serotine, greater horseshoe bat and lesser horseshoe bat recorded foraging and commuting across the Site.
<b>Roosting Bats</b>	Numerous trees on-site with potential to support roosting bats. Common pipistrelle day roosts associated with building B1 and B3 located within the southern parcel.
<b>Great Crested Newt</b>	Continued presence of a medium-sized metapopulation of great crested newt associated with the northern parcel (waterbodies P1-P4) and a small population associated with the southern parcel (waterbody P7).
<b>Common Reptiles</b>	Presence of a common reptile population assumed based on local records and habitat suitability.

## Likely Significant Effects

8.7.13 The effects on Biodiversity receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 8.11**.

**Table 8.11 Ecological Receptors Scoped in for Further Assessment**

Receptor	Likely Significant Effects
<b>Local Sites</b>	
<b>Pwllgwinau, East of Newbridge SINC</b>	Potential impacts associated with contaminated surface water run-off from development footprint to waterbody.
<b>Mynydd Maen, East of Newbridge SINC</b>	Potential impacts from land-take causing temporary and permanent damage/loss of habitats within the SINC from construction of the access route and turbines.
<b>Coed Cil-Lonydd, East of Newbridge SINC</b>	Potential impacts associated with temporary and permanent damage/degradation of habitats within the SINC from construction of the access route and turbines given proximity to Site
<b>Gwydon Valley Woodlands, Abercarn SINC</b>	Potential impacts associated with temporary and permanent damage/degradation to habitats within the SINC from construction of the access route and turbines given proximity to Site
<b>Cwm Hafod-Fach Woodlands, North of Abercarn SINC</b>	Potential impacts associated with temporary and permanent damage/degradation to habitats within the SINC from construction of the access route and turbines given proximity to Site
<b>Craig Gwent Wood Ancient Woodland SINC</b>	Potential impacts associated with temporary and permanent damage/degradation to habitats within the SINC following a deterioration in air quality during construction.
<b>River Ebbw SINC</b>	Potential impacts associated with contaminated surface water run-off from the development footprint to the River Ebbw and/or its tributaries.
<b>Habitats</b>	
<b>Treelines and Hedgerows</b>	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route and turbines.
<b>Unimproved Acid Grassland</b>	Potential impacts associated with temporary and permanent damage/degradation to habitats within the SINC from construction of the access route and turbines given proximity to development footprint
<b>Aquatic Features</b>	<p>Potential impacts associated with temporary and permanent damage/degradation to habitats within the SINC from construction of the access route and turbines given proximity to development footprint.</p> <p>Potential for damage/degradation associated with contaminated surface water run-off to waterbodies.</p>
<b>Protected Species</b>	



<b>Commuting and Foraging Bats</b>	Potential for killing/injury of bats commuting and foraging within and through the Site.
<b>Roosting Bats</b>	No trees confirmed to have roosting bats, but a number of trees with potential to support bats to be lost to facilitate turbine construction, in addition to occurring within the buffer zone. Potential loss of bat roosts and killing/injury of bats if bats colonise these trees, as well as indirect effects on bats in other nearby roosts. Potential killing/injury of bats associated with roosts supported by on-site buildings.
<b>Great Crested Newt</b>	Loss of suitable terrestrial habitat with potential for degradation/damage to waterbodies in proximity to the development footprint. Potential for killing/injury of GCN present during habitat clearance and construction works.
<b>Common Reptiles</b>	Loss of suitable habitat. Potential killing/injury during habitat clearance and construction works.

- 8.7.14 The receptors/effects detailed in **Table 8.12** have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant.

**Table 8.12 Summary of Effects Scoped out of the Biodiversity Assessment**

<b>Receptors/Potential Effects</b>	<b>Justification</b>
<b>International Sites</b>	
<b>Aberbargoed Grasslands SAC, River Usk SAC, Usk Bat Sites SAC, Cwm Clydach Woodlands SAC, Severn Estuary SPA/SAC/Ramsar, Cardiff Beech Woods SAC, Sugar Loaf Woodlands SAC, Coed y Cerrig SAC, Wye Valley and Forest of Dean Bat Sites SAC, River Wye SAC, Blaen Cynon SAC, Llangorse Lake SAC, Wye Valley Woodlands SAC, Cwm Cadlan SAC, Brecon Beacons SAC.</b>	No likely significant effects given distance and spatial separation from the Site and nearest turbine.
<b>National Sites</b>	
<b>Ty'r Hen Forwyn SSSI, Coed-y-Darren Memorial Park Meadows Pontllanfraith SSSI, Henllys Bog SSSI, Dan y Graig Quarry, Risca SSSI, Penllwyn Grasslands SSSI,</b>	No likely significant effects given distance and spatial separation from the Site and nearest turbine.

**Aberbargoed Grasslands  
SSSI/NNR,  
Llandegfedd Reservoir SSSI  
Siambre Ddu SSSI,  
Plas Machen Wood SSSI,  
Cwm Merddog Woodlands  
SSSI,  
Ruperra Castle and Woodlands  
SSSI,  
Cefn Y Brithdir SSSI,  
Cilwrgi Quarry  
Nelson Bog SSSI,  
Cwn-Ton, Glascoed SSSI,  
Blorengel SSSI,  
Llanbradach Quarry SSSI,  
River Usk (Lower Usk) SSSI,  
River Usk (Lower Usk) SSSI,  
Wern Ddu Claypits SSSI  
Cefn Onn SSSI,  
Brook Cottage, Llanybi SSSI,  
Gwaun Gledyr SSSI,  
Gwent Levels St Brides SSSI,  
Fforestganol A Chwm Nofydd  
SSSI/LNR,  
Cwm Clydach SSSI/NNR,  
Priory Wood SSSI,  
Gilwern Hill SSSI,  
Gwent Levels Rumney and  
Peterstone SSSI,  
Lanishen and Lisvane  
Reservoir Embankments SSSI,  
Lisvane Reservoir SSSI,  
Cwm Llanwenarth Meadows  
SSSI,  
Mynydd Llangatwg (Mynydd  
Llangattock) SSSI  
(encompassing Craig Y Cilau  
NNR),  
Penpergwm Pond SSSI,  
Severn Estuary SSSI,  
Coed-Y-Person SSSI,  
Gwent Levels Nash and  
Goldcliff SSSI,  
Gwent Levels Whitson SSSI  
Llanover Quarry SSSI.**

#### Local Sites

**Coed Ffordd-Fawr, Abercan  
SINC,  
Coedcae Watkin Dafydd, East  
of Crumlin SINC,  
Swffryd Wood SINC,  
Cefn y Crib SINC,  
Pontbren, North of Crumlin  
SINC,  
Monmouth to Brecon Canal  
SINC,  
Swffryd Quarry SINC,**

No likely significant effects given distance and spatial separation from the Site and nearest turbine.

## Tyle-Coch Wood, North of Abercan SINC.

### Habitats

**Plantation Woodland, Broadleaved Woodland and Scrub, Dense/Scattered Scrub, Semi-improved Neutral Grassland, Poor Semi-improved Grassland, Improved Grassland, Bracken, Tall Ruderal Vegetation, Built Structures.**

No likely significant effects as these habitats either do not lie within the access route or turbine locations, or loss of these habitats is of negligible significance given their low distinctiveness, limited extent and/or poor structural/botanical diversity.

### Protected Species

#### Dormouse

Not present within the Site or surrounding area surveyed.

#### Badger

Not present within the Site or surrounding area surveyed.

#### Otter

Not present within the Site or surrounding area surveyed.

#### Water Vole

Not present within the Site or surrounding area surveyed.

#### Invertebrates

Presence of a significant populations of notable invertebrate species unlikely due to dominance of botanically/structurally poor, agricultural improved habitats unlikely to

## 8.8 Assessment Methodology

- 8.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to Preparing the Environmental Statement**, and specifically in **Sections 2.7 to 2.10**. However, whilst this has informed the approach that has been used in this Biodiversity assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Biodiversity assessment.
- 8.8.2 The evaluation of IEFs will be made with reference to the guidelines published by the CIEEM. The guidelines propose an approach to valuing ecological features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the Project and/or the distribution and status of the species or features that are being considered. In addition, best practice guidance in relation to survey techniques and mitigation measures will also be taken into account.

## Geographical Context

- 8.8.3 The guidelines recommend that the value or potential value of the important ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used:
- International;
  - National (Wales);
  - County (Caerphilly); and
  - Local (considered as the 2km Study Area around the Survey Boundary).
- 8.8.4 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

## Valuing Species

- 8.8.5 The guidelines require consideration of all protected species as 'important' features where there is the potential for a breach in legislation. Additionally, both species and habitats should be assessed according to their biodiversity value, measured against published selection criteria where available, such as those protected under the Conservation of Habitats and Species Regulations 2017 (as amended), or those listed as priority species or habitats under Section 7 of the Environment (Wales) Act 2016. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records, as well as their legal protection, whilst using any relevant published evaluation criteria available at the time of assessment. Where habitats do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at the time of the assessment.

## Characterising Potential Impacts

- 8.8.6 The guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the ZoI that are expected to occur if the Proposed Development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features as well as further consider impacts to the relevant ecosystem as a whole. The process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the ZoI during the lifetime of the Development.
- 8.8.7 When describing changes/activities and impacts on ecosystem structure and function, it is necessary to take into account the following parameters:
- Beneficial or adverse;
  - Extent;
  - Magnitude;
  - Duration;
  - Timing;

- Frequency; and
- Reversibility.

## Significance Criteria

- 8.8.8 The CIEEM guidance defines an ecologically significant impact as an *'effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general'*. Once a potential significant impact is identified as likely to affect the integrity/ favourable conservation status of a potential IEF, the value of the receptor will be used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below a local level, or is deemed not to be significant, will be scoped out of the impact assessment.
- 8.8.9 Although certain species may not constitute IEFs based upon their nature conservation value, they may still warrant consideration during the design and mitigation of the Proposed Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.
- 8.8.10 The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.
- 8.8.11 Due to the application of the CIEEM Guidelines, the impact assessment presented in this chapter differs slightly in approach to the remainder of the ES, with each IEF being assessed in terms of whether or not an impact (beneficial or adverse) is significant (assessment of impact), alongside the geographical scale at which this occurs (importance of feature). In each case, for consistency with the remainder of the ES, a conclusion is then presented as to whether or not a significant effect will occur, with such effects being described as either adverse or beneficial. No scale is ascribed to the assessment of effects (i.e., they are either significant or not significant) except in relation to the geographic context.
- 8.8.12 The significance of the potential impacts upon IEFs will be assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the Proposed Development. Consideration will also be given to the potential future impacts to IEFs arising as a result of global trends and climate change.
- 8.8.13 Additionally, and in accordance with Conservation of Habitats and Species Regulations 2017 (as amended), screening will also be required to determine if likely significant effects upon pertinent designated sites comprising the National Site Network (i.e., SACs and SPAs) would arise as a result of the Proposed Development and, if this is the case, for an appropriate assessment to be undertaken. Whilst the Habitats Regulations Assessment is the responsibility of the Competent Authority, information to inform this process will be prepared if required.

## 8.9 Assessment of Biodiversity Effects

- 8.9.1 An assessment of likely significant effects of the Proposed Development on those IEFs identified above has been undertaken based on the application plans. The quantum and layout of the Proposed Development incorporate inherent or embedded ecological mitigation as a result of an iterative assessment and design process, as set out above.
- 8.9.2 The likely effects are assessed with the inherent mitigation included, but in the absence of the additional mitigation measures required to address potentially significant effects.

Anticipated effects during the construction and operation/post-completion stage of the Proposed Development are discussed in turn below.

## Locally Designated Sites

- 8.9.3 Mynydd Maen, East of Newbridge SINC and Pwllgwinau, East of Newbridge SINC overlap with the boundary of the Site whilst, Coed Cil-Lonydd, East of Newbridge SINC, Gwydon Valley Woodlands, Abercarn SINC, Cwm Hafod-Fach Woodlands, North of Abercarn SINC and Craig Gwent Wood Ancient Woodland SINC lies directly adjacent to Study Area. The locations of these SINC are further described in **Appendix 8A**.
- 8.9.4 The boundaries of these SINC are, for the most part, located outside of the construction footprint of the turbines and access road, such that no impacts associated with direct habitat loss are predicted. Mynydd Maen, East of Newbridge SINC, however, overlaps with the existing road which may be widened to improve access for construction traffic with subsequent loss of species-poor grassland alongside adjacent road and field margins of Site level importance. As such, losses are not considered significant (in EIA terms), albeit permanent/temporary, probable and reversible in the short-medium term.
- 8.9.5 There is, however, the potential for physical damage/disturbance/degradation to designated habitat features from construction activities and traffic given their proximity to the Proposed Development. In absence of mitigation, owing to their separation from the construction footprint, impacts effects are considered to be **significant** at the Local level and would result in temporary, probable, reversible, adverse effects in the short-medium term. No additional effects during the operational phase are anticipated, however.
- 8.9.6 Impacts to waterbody P7 associated with Pwllgwinau, East of Newbridge SINC and the River Ebbw SINC during the construction phase could also potentially arise as a result of changes to water quantity and quality, the latter in respect of potential contaminated surface runoff and pollution. The unmitigated effects upon these SINC can be characterised as adverse, anticipated to be temporary, probable and reversible in the short-medium term and **significant** at the Local level. There will be no additional effects during the operational phase.

## Mitigation

- 8.9.7 In respect of the potential for temporary loss/damage of improved and poor semi-improved grasslands within field margins and road verges during upgrades to an existing access road, this habitat will be restored following completion of construction.
- 8.9.8 A CEMP will be in place and is to be continually updated and implemented during the entirety of the construction stage to ensure appropriate management and operational systems are in place to avoid or minimise adverse pollution effects during construction.
- 8.9.9 The ECMS will contain measures to physically protect retained habitats on-site and adjacent through the establishment of Ecological Protection Zones (EPZs). This will include specifications for protective fencing and signage to prevent activities such as the incursion by vehicles or personnel, fires and stockpiling of materials, together with the identification of responsibilities for maintaining this fencing/signage during the construction period. Generally, protective fencing will be erected as recommended within BS5837: 2012 Trees in relation to Design, Demolition and Construction. Protective fencing will incorporate the full RPA of the feature to be retained and will be protected and maintained throughout the duration of all site-enabling and pre-construction activities.
- 8.9.10 The ECMS will also include the restriction of construction activities to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, with



directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting.

- 8.9.11 To protect water quality of the River Ebbw SINC and waterbody P7 associated with Pwllgwinau, East of Newbridge SINC during the construction phase, appropriate pollution control measures will be employed in accordance with the relevant Pollution Prevention Guidelines (PPGs) published by the Environment Agency, namely PPG1 'General guide to the Prevention of Pollution', PPG5 'Works and Maintenance in or Near Water', PPG6 'Pollution Prevention Guidance for Working at Construction and Demolition Sites', and PPG21 'Pollution Incident Response Planning', to ensure that detrimental effects on nearby watercourses as a result of surface run-off, spillage and pollution arising throughout the construction phases are avoided. While these documents have been withdrawn by the Environment Agency, they are still considered to provide the benchmark for pollution prevention.
- 8.9.12 Subject to implementation of the above mitigation, likely residual effects upon non-statutory designations, will be negligible at the Local level.

## Habitats

- 8.9.13 The construction of Turbines 1-4 will result in the loss of areas of improved and poor semi-improved grassland of Site level importance only. Construction works required to upgrade existing/create additional access routes to these turbine locations will also result in loss/damage to additional areas of such habitats. Such impacts are not considered significant in EIA terms.
- 8.9.14 With respect to unimproved acid grassland of local importance, there is the potential for minor loss and/or damage/degradation of this feature present within field F24 given the proximity of the proposed access road. This habitat is, however, very limited in extent such that impacts are not considered significant and would be permanent/temporary, probable, irreversible in the short-medium term and **significant** at the Site level.
- 8.9.15 The construction of Turbine 4 may also require the direct loss of trees associated with tree group G323 (**Appendix 8B**) to facilitate construction of the turbine base/foundation. In respect of the proposed access route, construction works necessary to upgrade the existing highway (including widening and cut and fill works) combined with the creation of new access routes through agricultural fields may also result in additional loss/damage to trees (**Appendix 8C**) given the proximity of tree standards and/or RPAs to the construction footprint. In the absence of mitigation, the effect of Proposed Development upon these valued habitats is characterised as being adverse, permanent/temporary, probable, long-term, potentially irreversible and **significant** at the Local level. There will be no additional effects during the operational phase.
- 8.9.16 In addition to direct habitat loss, retained trees may be subject to indirect degradation impacts, such as soil compaction, damage to RPAs and encroachment by machinery from adjacent construction works, which may in turn result in death or disease, and a decline in the regulatory ecosystem services provided by such habitats. In the absence of mitigation, the extent and magnitude of such probable, short-medium term, potentially frequent (i.e., for the duration of construction), temporary and reversible impacts and in the absence of mitigation, may result in **significant** effects up to a Local level.
- 8.9.17 As discussed above in relation to non-statutory designations, there is the potential for impacts upon aquatic features, namely waterbody P2 in the northern parcel and P7 in the southern parcel, arising as a result of contamination/pollution incidents. The unmitigated effects upon these SINC's can be characterised as adverse, anticipated to be temporary and reversible in the short-medium term and **significant** at the Local level.

8.9.18 There will be no additional effects during the operational phase.

## Mitigation

- 8.9.19 In respect of the potential for temporary loss/damage to a small area of unimproved acid grassland during upgrades to an existing access road, this habitat will be restored following completion. Where possible, acid grassland turves will be subject to sensitive cutting and storage during the construction period for translocation following completion of construction, reinstating turves and those plant communities established therein so as to minimise the extent of habitat loss. The LEMP will also set out in detail those measures to be implemented across the Proposed Development to ensure the successful establishment/installation of reinstated and new habitats/features and the long-term maintenance and management of such to compensate for proposed habitat loss.
- 8.9.20 In respect of impacts upon trees, the micro-siting of Turbine 4 and alignment of proposed access routes will be undertaken so as to minimise the loss of trees otherwise necessary to facilitate construction. Where tree removal is otherwise required to facilitate access and construction of associated infrastructure, mitigation will include the provision of new, native hedgerow and tree planting utilising species of local provenance at a ratio of three trees for every one lost, to further strengthen the existing vegetated field boundaries through infill planting and habitat creation. Where tree loss is unavoidable, suitable specimens will be subject to translocation elsewhere on-site to speed up establishment to further maximise connectivity as far as possible.
- 8.9.21 In addition, the ECMS together with the CEMP will set out in detail those measures to be implemented to protect IEFs during the construction phase of the Proposed Development, with the implementation of the ECMS overseen by an appointed ECoW. The ECMS will also cross reference the CEMP, which will include additional measures to ensure appropriate management prescriptions are in place to avoid or minimise adverse pollution effects on waterbodies P7 and P2 in particular.
- 8.9.22 Post-mitigation, effects will be negligible at the Local level.

## Protected Species

### Bats

#### Foraging/Commuting

- 8.9.23 A total of nine bat species/species groups were recorded foraging and/or commuting across the study area between May and October 2020, April and October 2021 and June and August 2023, including the following species: common pipistrelle, soprano pipistrelle, long-eared bat species, myotis bat species, noctule, serotine, lesser horseshoe bat, greater horseshoe bat and Nathusius' pipistrelle.
- 8.9.24 Best practice guidance considers the potential collision risk for each species based on its behaviour and ecology and evidence of casualty rates in the UK and Europe, in combination with its relative abundance, to determine the potential vulnerability of populations of British bat species. For Wales, and in consideration of those species recorded across the study area, noctule and Nathusius' pipistrelle are considered 'high vulnerability' species with respect to wind farm development. Common pipistrelle, soprano pipistrelle, serotine and greater horseshoe are considered 'medium vulnerability' species, whilst brown long-eared, myotis bat species and lesser horseshoe are considered 'low vulnerability' species.
- 8.9.25 The vast majority of registrations recorded by the automated detectors relate to common pipistrelle (which was similarly the case in respect of the walked transect surveys)

followed by soprano pipistrelle and Myotis bat species. Noctule, serotine, long eared bat, lesser horseshoe bat, greater horseshoe bat and/or Nathusius' pipistrelle bats otherwise representing the remainder of the bat activity during 2020, 2021 and in 2023.

- 8.9.26 Best practice guidance recommends that all turbines are located at least 50m between the turbine blade tip (117m diameter, 58.5m radius) and the nearest bat habitat feature including woodland, tree lines and hedgerows. The guidance also sets out a calculation to determine the minimum distance the centre of a turbine should be located from such vegetation, which is calculated using the following equation:  $b = \sqrt{(50+bl)^2 - (hh-fh)^2}$ ; whereby:  $b$  equates to the distance between the edge of the feature and centre of the tower (the bat habitat buffer);  $bl$  is blade length;  $hh$  is the hub height; and  $fh$  is the feature height (vegetation height).
- 8.9.27 In respect of Turbine 1 with a blade length of 58.5m and a hub height of 84m, together with the median height of the surrounding vegetation being c.16m, the distance the turbines should be from vegetation is calculated as:  $\sqrt{(50+58.5)^2 - (84-16)^2} = 84.56\text{m}$ .
- 8.9.28 In respect of Turbine 2 and 4 with a blade length of 58.5m and a hub height of 84m, together with the median height of the surrounding vegetation being c.18m, the distance the turbines should be from vegetation is calculated as:  $\sqrt{(50+58.5)^2 - (84-18)^2} = 86.12\text{m}$ .
- 8.9.29 In respect of Turbine 3 with a blade length of 58.5m and a hub height of 84m, together with the median height of the surrounding vegetation being c.15m, the distance the turbines should be from vegetation is calculated as:  $\sqrt{(50+58.5)^2 - (84-15)^2} = 83.73\text{m}$ .
- 8.9.30 To inform this calculation per turbine location, **Table 8.13** provides details pertaining to the habitat type at each turbine location and minimum distance of suitable bat habitat from each turbine location, informed by the results of the habitat surveys and review of aerial photography. The estimated height (median) above ground level of the nearest suitable vegetation for bats is also provided, informed by the results of a BS5837:2012 tree survey undertaken during August and September 2023 (**Appendix 8B**).

**Table 8.13 Bat Habitat Features in Relation to Turbine Locations**

Turbine Location	Habitat at Turbine Location	Distance of Nearest Bat Habitat Feature	Median Height of Nearest Suitable Vegetation (fh)	Required Distance of Turbine from Vegetation (b) based on Median Height
1	A large, unmown and ungrazed field with an improved sward. The boundaries are for the large part, defined by a wall with a line of scattered trees along the fields southern and part of its western boundary/	101m – group of mature beech trees on north-western edge of field boundary.	16	84.56
2	A relatively large field, lightly grazed at the time of survey in 2023 and dominated by a poor semi-improved sward. A fence line delineates the eastern and northern boundary whilst a tree line is present along the western and southern boundaries.	60m – mature line of trees to west delineating western field boundary	18	86.12

3	A poor semi-improved grassland field heavily grazed by beef cattle with northern, eastern and western boundaries delineated by a line of mature trees. A pond is present in the north-west corner of this field.	29m – mature line of trees along part of western boundary of field with trees further to the east and south also.	15	83.73
4	A lightly sheep grazed poor semi-improved grassland with mature trees present along field boundaries.	0m – Located within/adjacent to mature beech treeline in corner of field	18	86.12

- 8.9.31 As per the above table, Turbine 1 is considered to be sufficiently distant from woodland, trees or other suitable bat habitat, as illustrated at **Figure 8.1**.
- 8.9.32 However, Turbine 4 is sited within an existing tree belt, whilst Turbines 2 and 3 are located 60m and 29m from the nearest vegetation respectively. Impacts arising upon bats will therefore be greatest in respect of Turbines 2, 3 and 4 as a 50m offset distance between the blade tip and adjacent bat habitat features cannot be achieved for these turbines, whilst Turbine 4 will also require the removal of trees associated with tree group G323 to facilitate construction of the turbine base and associated foundations.
- 8.9.33 Impacts during the construction phase, requiring the removal of trees to facilitate construction of Turbine 4, with a subsequent reduction in potential foraging habitat and fragmentation of/disturbance to flight lines, are considered adverse, certain, permanent/temporary, long-term, potentially irreversible and **significant** at the Local level in the absence of mitigation.
- 8.9.34 With respect to those habitat features to be retained, degradation through damage/disturbance during construction could also result in the further loss of roosting and breeding sites in addition to habitats important for foraging, dispersal and migration. In the absence of mitigation, the effects upon bats are considered to be adverse, probable, short-medium term, reversible and **significant** at the Local level.
- 8.9.35 Impacts during the operational phase include the potential killing/injury of bats due to barotrauma when flying in close proximity to the turbines given the presence of hedgerows and tree lines within close proximity to Turbines 2, 3 and 4, including bats roosting within or nearby to the Site, and those commuting and migrating through the Site, particularly during the late summer and autumn months (i.e., August - October). Such impacts will be greatest upon noctule and Nathusius' pipistrelle, these species being classed as high vulnerability species confirmed to utilise the Site, with greatest impacts likely arising from Turbines 3 and 4 given proximity to vegetation but also being located within areas which experienced the greatest levels of bat activity during manual transect surveys and automated detector surveys. With respect to Turbine 2, only moderate levels of activity were recorded here during the bat activity season, with activity dominated by common pipistrelle (medium vulnerability species) and on one occasion each for greater horseshoe (medium vulnerability species) and long-eared bat (low vulnerability species<sup>29</sup>).
- 8.9.36 In absence of mitigation, effects during the operational stage will be adverse, certain, permanent, long-term, irreversible and **significant** at the Local level.

<sup>29</sup> Recordings of long-eared bat attributed to brown long-eared bat (assumed, given current, known distribution and rarity of grey long-eared bat).

## Roosting

- 8.9.37 No evidence of roosting bats was identified for those trees occurring within the vicinity (130m) of the turbine locations (**Appendices 8A** and **8B**) when subject to detailed assessment. A total of 14 trees were confirmed as having high potential to support roosting bats however, with 59 trees assessed as having moderate potential and 153 trees with low potential. Of these, none are associated with Turbine 1 and its associated bat habitat buffer. However, three low potential trees are located within the bat habitat buffer of Turbine 2, whilst two high, two moderate, and seven low potential trees are located within the bat habitat buffer of Turbine 3, and a further two moderate and 18 low potential trees are located within the bat habitat buffer of Turbine 4 (**Figure 8.1**).
- 8.9.38 In respect of those trees associated with the footprint of the proposed improvement works to the access route (**Appendix 8C**), three trees (G181, G189(1) and T215) were confirmed as having low potential to support roosting bats.
- 8.9.39 Given the absence of roosting bats, however, impacts associated with loss/damage/disturbance of these features is considered negligible. In the absence of roosting bats, direct impacts associated with loss/damage/disturbance of these trees are considered unlikely. Due to the transitory nature of this species group, however, a roost may establish itself at a later date in which case adverse, permanent and irreversible effects associated with the loss of tree roosts, and subsequent harm/injury of bats may arise.
- 8.9.40 Indirect disturbance (particularly light spill) upon potential tree roosts and commuting/foraging habitat may also arise during construction. Such impacts could result in the abandonment of roosts, foraging territories and of commuting and dispersal corridors, which could significantly affect those species supported by the Site. Such disturbances arising can be intermittent, frequent, and/or constant throughout the construction period. However, given that the majority of the works will be undertaken during daylight hours, the usage of artificial lighting will likely be limited to the early morning and early evening hours, with greater requirements for artificial lighting during the winter months. Overall, potentially adverse effects arising from indirect disturbance upon the local bat assemblage, although minor and temporary, are considered to be significant at the Site level only.
- 8.9.41 With respect to bat roosts supported by built structures occurring within the vicinity of the turbine locations, buildings B1 and B3 associated with Glan Shon Farm at the southern extent of the southern parcel were both confirmed to support an occasional day roost for common pipistrelle bats, whilst buildings B2 and B4 were considered to have moderate and low bat roost potential respectively. None of these built structures are to be impacted by the proposals however, given their distance and spatial separation from the construction footprint.

## Mitigation

### Construction

- 8.9.42 Micro-siting of Turbine 4 will be undertaken to ensure the construction footprint of this turbine fully avoids the existing tree line and its associated RPAs. In addition, the micro-siting of Turbines 2 and 3 will also be undertaken to minimise as far as possible the overlap of the bat habitat buffer with existing trees and woodland habitat occurring within its vicinity.
- 8.9.43 Where trees with bat roost potential are to be lost to/impacted by development, in the absence of roosting bats, an EPS Development Licence from NRW will not be required.



However, due to the transitory nature of tree roosting bats in particular, precautionary measures will be necessary. Specifically, an update inspection of bat roosting features previously identified will be undertaken by a suitably qualified and NRW bat licensed ecologist and/or arboricultural contractor, and no more than 48 hours prior to commencement of works. Should a bat roost be confirmed within any trees to be impacted by the proposals, an EPS Development Licence from NRW will be required prior to works commencing.

- 8.9.44 To obtain a licence, it must be demonstrated that there will be no detriment to the maintenance of the favourable conservation status of the local bat population, with the loss of any confirmed roosts compensated for through the provision of new roosting habitat (e.g., bat boxes installed upon trees situated at least 200m away from the turbine locations).
- 8.9.45 Where no roosts are found but bat roosting potential remains, such trees should be subject to a 'soft' felling methodology by a suitably qualified arboricultural contractor with experience of working with bats, following the advice of the suitably qualified and licensed ecologist and supervised where necessary.
- 8.9.46 All retained trees with bat roost potential will further be included within EPZs throughout construction. Construction activities will also be restricted to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting.
- 8.9.47 Protection of species during construction will be ensured through implementation of the ECMS. As a general measure aimed at protecting species, 'toolbox talks' will be provided by suitably qualified ecologists to the principal contractor appointed by the Developer, for distribution to all employees involved in any enabling works/vegetation clearance, to ensure that identification and protection of the relevant species, their habitats is understood.
- 8.9.48 The CEMP will also be implemented during the entirety of the construction stage to ensure appropriate management prescriptions are in place, including the implementation of restricted working hours so as to avoid or minimise adverse lighting effects.

## Operation

- 8.9.49 When the turbines are idling, the blades will be prevented from turning at low wind speeds, referred to as 'feathering'. The implementation of feathering has been shown to reduce fatality rates during idling times by 50%, with no resultant loss in output. Feathering will be included as an automated response as part of a Supervisory Control and Data Acquisitions (SCADA) system. This would either involve locking or angling the blades such that they are parallel to wind direction.
- 8.9.50 In combination with feathering of the blades, the turbines will also be curtailed at wind speeds below 6.5 metres per second (m/s; measured at the nacelle height), to raise the cut-in speed at which the turbine blades move and begin to generate electricity. Bats are known to fly when wind speeds are low; as such, curtailing turbine activity at low wind speeds will reduce the risk of bats being killed or injured by the turbines.
- 8.9.51 Micro-siting of Turbines 2, 3 and 4 will be undertaken to minimise as far as possible the extent of overlap of existing trees and woodland habitat occurring within the bat habitat buffer of these turbines. To ensure a 50m offset from the blade tip to nearest bat habitat feature however, necessary to minimise collision risk, the felling of trees and woodland will be required. In this instance, compensatory planting will be undertaken on-site, at a minimum ratio of three trees of a similar type planted for every one lost, and in respect of



woodlands, at a planting rate of 1600 trees per hectare in respect of for broadleaved woodland, and 2500 trees per hectare in respect of coniferous woodland.

- 8.9.52 Alternatively, curtailment of all or some these turbines will be undertaken, with curtailment programmed to occur between sunset and sunrise during the months of May-September when temperatures rise above 7°C, and when windspeeds drop below 6.5 m/s (measured at nacelle height), so as to minimise impacts to bats potentially utilising the surrounding habitat features.
- 8.9.53 Additionally, the timing of curtailment can also be informed through subsequent monitoring, and be adjusted to satisfy times when those bat species with a high vulnerability to collision risk (i.e., noctule and Nathusius' pipistrelle) are present and active, i.e., between sunset and sunrise during August, September and October when temperatures rise above 7°C and windspeeds drop below 6.5 m/s (measured at nacelle height). The SCADA system will also be linked to a continual acoustic monitoring system, installed at the turbine nacelle, which records bat registrations to enable real-time analysis of the data received. This will allow the acoustic monitoring system to require the curtailment of the turbine as soon as bats are recorded near to the turbine, with curtailment possible as a response to any bat species or specific bat species which are considered to be at higher risk of collision. This will reduce bat fatalities as well as reducing costs associated with blanket curtailment of the majority of turbines across the Site when bats may otherwise not be present.
- 8.9.54 Post-construction monitoring will also be carried out to assess the effectiveness of the above feathering and curtailment measures, to inform any additional mitigation that may be required. Such monitoring will comprise the passive, acoustic monitoring of bat activity, as well as active searching for bat carcasses beneath turbines. Acoustic monitoring will determine whether there has been any reduction in bat activity at the Site following construction of the turbines, in which case the level of curtailment could potentially be reduced. Carcass searching will also be employed beneath the turbines, involving a systematic search of the ground beneath the turbine blades for the presence of bat carcasses (by hand and/or employment of a trained sniffer dog). Should an increase in bat carcasses be recorded during the year, additional mitigation measures will be employed, such as further curtailment of the turbines during these months or during specific weather conditions.
- 8.9.55 The details of this mitigation and monitoring strategy will be set out in a CMMS, which can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.
- 8.9.56 Post-mitigation, effects will be negligible at the local level.

## Great Crested Newt

- 8.9.57 The vast majority of habitats occurring on-site considered suitable to support a great crested newt population will be retained and buffered from the development footprint including waterbodies P2 and P7 supporting a medium and small population of great crested newt respectively. However. Some minor losses are anticipated to facilitate construction of proposed turbines and their access roads.
- 8.9.58 Whilst no such losses are anticipated within 50m of confirmed breeding ponds P2 and P7, comprising this species' 'core territory', temporary losses are anticipated across 'intermediate habitats', (i.e., those habitats occurring between 50m and 250m of breeding ponds) and 'distant habitats' (i.e., those occurring within 250m and 500m of breeding ponds) to facilitate construction of Turbines 1 and 3. This is in addition to the potential loss and degradation of intermediate habitats associated with waterbody P1 located offsite to the north of the existing access track. Such losses are confined to improved and poor

semi-improved grassland considered sub-optimal for a great crested newt population given its poor structural and botanical diversity with limited refugia. This is in addition to the potential loss of mature trees associated with boundary features to facilitate the creation of access roads. Such woody habitats are considered to be of variable value to the great crested newt population supported with respect to foraging, refuge and dispersal.

- 8.9.59 The reduction of available intermediate and distant habitats supporting a medium/small great crested newt population is considered adverse, certain, temporary/permanent, short-medium, reversible and **significant** at the Local level.
- 8.9.60 Additionally, increased levels of traffic movements by vehicles, machinery and plant throughout the construction phase could increase the potential risk of casualties upon this species, particularly when constructing access roads and removing vegetation across which species disperse and forage. Such impacts are considered adverse, permanent, short-term, irreversible and **significant** at the Local level.
- 8.9.61 With respect to aquatic habitats, indirect impacts upon waterbodies P2 and P7 may arise as a result of surface water runoff affecting water quality during the construction phase, given its close proximity to the development footprint. Such impacts are not anticipated to arise upon waterbodies P1, P5, P6, P8 and P9 however, given their distance from the Proposed Development. Such impacts are considered adverse, possible, temporary, short-term, potentially irreversible and **significant** at the Local level.
- 8.9.62 Assuming waterbodies P2 and P7 are groundwater-fed, either in their entirety or in part, there is also the potential for further indirect effects following changes to the underlying water table during construction of the turbines in respect of foundation excavations and construction of associated access roads. Such changes in water quantity could lead to the drying of on-site ponds and subsequent temporary loss of aquatic habitat of value to great crested newt for breeding. Such impacts are considered adverse, probable, temporary, short-medium term reversible and **significant** at the Local level.

## Mitigation

- 8.9.63 The removal of terrestrial vegetation suitable for great crested newt will be undertaken in accordance with the measures detailed within an approved NRW Development Licence. Pre-commencement mitigation for great crested newt will include the following:
- Prior enhancement of a receptor site comprising core habitat around waterbodies P2 and P7 through creation of hibernacula and refugia and sensitive interim habitat management prior to commencement of any vegetation clearance works, so as to increase structural diversity and maximise existing carrying capacity for great crested newt;
  - The above may be combined with the enhancement of grassland swards through supplementary seeding, use of green hay and/or translocation of suitable grassland otherwise lost where appropriate;
  - Installation of great crested newt exclusion fencing in association with the construction footprint associated with proposed turbines located within 250m of waterbodies P2 and P7, to ensure no interaction of great crested newt with those habitats to be lost/disturbed whilst maintaining connectivity for dispersal of a great crested newt populations across habitats to be retained;
  - The installation of internal drift fencing within any trapping compartments, followed by the trapping and translocation of the great crested newt population within 250m of waterbodies P2 and P7 where impacted by construction works to the identified receptor site outside of the construction footprint; and

- Phased vegetation clearance of the construction footprint under an ecological watching brief during and upon completion of a translocation programme.

- 8.9.64 Where potential impacts to waterbodies P2 and P7 associated with drying/draw down are likely, new pond creation will be required as mitigation and to provide alternative aquatic habitats for a great crested newt population during the construction period. Given the temporary nature of such impacts, new ponds should be created on a minimum 1:1 basis (loss:creation). Pond creation combined with enhancement of terrestrial habitat within a 50m radius of ponds should be undertaken prior to construction and will provide an alternative receptor site for the translocation of a great crested newt population from the construction footprint.
- 8.9.65 Upon completion of construction, areas of improved and poor semi-improved grassland, marshy grassland and acid grassland subject to temporary loss during the construction period will be restored and further enhanced through supplementary seeding and sensitive management aimed at increasing structural diversity of the swards.
- 8.9.66 Any trees to be removed to facilitate construction will be compensated following completion of construction, through the provision of new, native tree planting at a ratio of three trees planted for every one tree lost, utilising species of local provenance to further enhance boundary habitats. An NRW Development Licence and LEMP will be prepared for the Proposed Development, which will set out in the detail those measures to be implemented to ensure the successful establishment/installation of new habitats/features and the long-term maintenance and management of the retained and enhanced habitats/features for great crested newt.
- 8.9.67 Post-mitigation, effects will be negligible at the local level.

## Reptiles

- 8.9.68 The vast majority of habitats occurring on-site considered suitable to support a common reptile population will be retained and buffered from the development footprint. Nevertheless, construction impacts will result in minor losses. The common reptile population present on-site is assessed as being of less than Local ecological importance however, such that permanent habitat losses are not significant in EIA terms.
- 8.9.69 Nevertheless, the clearance of suitable reptile habitat during construction works, in addition to other impacts arising such as an increase in construction traffic, could result in the killing or injury of common reptiles. Such actions would constitute an offence under the Wildlife and Countryside Act 1981 (as amended), compliance with which is assumed as being inherent to the Proposed Development.
- Prior to mitigation, effects during the construction phase are adverse, probable, permanent, long-term, irreversible and **significant** at the Local level. There will be no additional effects during the operational phase. Mitigation
- 8.9.70 During vegetation clearance, a habitat manipulation exercise will be carried out to ensure any reptiles found are moved to retained habitats away from the construction zone, to avoid injuring or killing of any reptiles. This will involve a sensitive, two-stage clearance of vegetation suitable for common reptiles, under supervision of an ECoW, with individuals allowed to disperse naturally, or captured by hand and relocated outside of the construction footprint. As reptiles will occur within the same habitats as great crested newt, clearance of habitat within 250m of a breeding pond would be undertaken under a GCN Development Licence from NRW.
- 8.9.71 The construction footprint will then be retained as unsuitable reptile habitat (bare ground) during the construction period to deter reptiles from recolonising these habitats until the

construction works have been completed. Details of this habitat manipulation exercise will be set out in detail in the ECMS.

8.9.72 Post-mitigation, effects will be negligible at the Local level.

## 8.10 Assessment of Cumulative (inter-project) Effects

- 8.10.1 A Cumulative Effects Assessment (CEA) has been undertaken for the Project which considers the combined impacts with other developments on the same single receptor or resource (inter-project effects). The detailed method followed in identifying and assessing potential cumulative effects is set out in **Section 2.9 of Chapter 2**.
- 8.10.2 The schemes to be considered in the cumulative assessment include the Proposed Development along with other existing and committed developments (i.e., those that have not been commenced but have a valid planning permission as well as those schemes which are in the planning process). The assessment of cumulative effects repeats the assessment process set out above, but considers the potential change caused by all schemes identified for cumulative assessment.
- 8.10.3 In respect of bats, the assessment area for cumulative effects has been calculated based on the Core Sustainance Zone (CSZ) of those bat species present within the Site. The CSZs range between 1-4km and as such, bats roosting within 4km of the Proposed Development as well as within 4km of other wind turbine sites could be affected by the Proposed Development. Cumulative effects are therefore assessed for those developments, principally wind farms which are either built, consented or with submitted scoping reports or planning applications, occurring within 8km of the Site's boundary.
- 8.10.4 The schemes listed in **Table 8.14** below have been included within the assessment of cumulative effects due to proximity to the Proposed Development.

**Table 8.14 Sites Included within the Cumulative Effects Analysis**

Site Name	Local Authority	Number of Turbines	Height to Blade Tip (m)	Approximate Distance from Boundary of Proposed Development	Consent Status
<b>Mynydd Maen</b>	Caerphilly County	15	150	Adjacent to north-east	Scoping
<b>Mynydd Llanhilleth</b>	Caerphilly County, Blaenau Gwent, Torfaen	8	180	2.7km north	Planning
<b>Abertillery</b>	Blaenau Gwent	7	180	4.6km north	Scoping
<b>Mynydd Carn-y-Cefn</b>	Blaenau Gwent	8	180	5.2km north-west	Planning

- 8.10.5 Wind farm schemes likely to have the greatest cumulative effects include those that lie within 4km of the Proposed Development, these being: Mynydd Maen (15 turbines); Mynydd Llanhilleth (eight turbines); Abertillery (seven turbines) and Mynydd Carn-y-Cefn

(eight turbines). These range in height from 150m (Mynydd Maen) to 180m (Mynydd Llanhilleth and Abertillery).

- 8.10.6 Cumulative effects of these wind farm developments potentially arising relate to the loss of foraging and commuting habitat as a result of direct habitat loss following construction of turbines, in addition to a likely increase in bat fatalities from barotrauma and collision during operation. Given the size and relative proximity of the schemes assessed, there is potential for *de minimis* adverse effects across the schemes to give rise to significant adverse effects upon IEFs, specifically bats.
- 8.10.7 Direct comparison between these sites is not possible given limited access to baseline data for these schemes and with differing survey techniques employed, coupled with the variation in age of such data. However, where ecological surveys and reports have been produced, these generally conclude that levels of bat activity are: (1) generally low within the vicinity of these sites, likely due to proposed turbine locations being generally sited away from suitable bat foraging and commuting habitat and across more exposed areas where bats are less likely to traverse; and (2) mostly attributable to common pipistrelle, a 'medium vulnerability' species and most commonly recorded species with the greatest activity levels (e.g. accounting for 93% and 81.5% of the total number of registrations collated during the 2020/2021 survey period at Mynydd Llanhilleth and Mynydd Carn-y-Cefn respectively). Where higher levels of bat activity are observed however, this is due to the presence of more suitable habitat features typically favoured by foraging or commuting bats such as along woodland edges, hedgerow boundaries and riparian corridors.
- 8.10.8 Additionally, it is expected that other developments will necessarily mitigate for any potentially significant adverse effects arising upon bats to insignificant levels, thereby reducing the risk of cumulative effects arising. Overall, therefore, no significant cumulative adverse effects upon the local bat population are expected to arise.
- 8.10.9 In respect of other species IEFs, and including other development types alongside those wind farm developments above, there is the potential for *de minimis* adverse effects across the schemes to give rise to significant adverse effects upon great crested newt. Cil-Lonydd Solar Farm (reference: DNS CAS-02446-R8X8W2), overlaps with the central parcel comprising the Proposed Development and lies in close proximity to the northern parcel; however, no species survey data for this scheme is publicly available. Nevertheless, this solar farm scheme, coupled with wind farm development proposed at Mynydd Maen located to the immediate north east of the Proposed Development, have the potential to impact waterbodies P2, P3 and P4 should turbine locations or infrastructure required to facilitate either scheme be proposed within 500m of these aquatic features. Nevertheless, in consideration of the limited extent of habitat loss and degradation anticipated during construction of the Proposed Development and those other schemes identified, the relatively limited range of this species, and the requirement for other developments to necessarily mitigate for any potentially significant adverse effects arising upon great crested newt to insignificant levels given their legal protection, significant cumulative adverse effects are not anticipated to arise upon local or county populations of great crested newt. This is similarly the case when considering common reptiles and other species IEFs.
- 8.10.10 In consideration of habitat IEFs, no significant cumulative adverse effects are anticipated to arise upon statutorily designated sites including Usk Bat Sites SAC, Siambre Ddu SSSI and Mynydd Llangattock SSSI (encompassing Craig Y Cilau NNR), with a lack of potential impact pathways identified given their distance and spatial separation. *De minimis* adverse effects across the schemes could give rise to significant adverse effects upon non-statutorily designated sites however, such as Mynydd Maen, East of Newbridge SINC Gwydon Valley Woodlands, Abercarn SINC, and Craig Gwent Wood Ancient Woodlands SINC, given their proximity to the Proposed Development and neighbouring schemes.

Given the limited extent of habitat loss and/or disturbance possibly required to facilitate development, relative to the significant size of these SINC's, coupled with the ability to sufficiently mitigate for impacts arising however, no significant cumulative adverse effects upon non-statutorily designated sites are expected to arise.

- 8.10.11 Subject to the implementation of the proposed ecological avoidance, mitigation and enhancement measures therefore, the residual effects of the Proposed Development alone will be negligible. The likelihood of significant cumulative adverse effects on ecological features arising in combination with the schemes listed above is also judged to be negligible.

## 8.11 Significance Conclusions

- 8.11.1 A summary of the results of the preliminary Biodiversity assessment is provided in **Error! Reference source not found.**



**Table 8.14 Summary of Significance of Effects**

Receptor	Summary of Predicted Effect	Importance of Receptor <sup>30</sup>	Magnitude of Change <sup>31</sup>	Significance of Impact <sup>32</sup>	Summary Rationale
<b>Local Sites</b>					
<b>Mynydd Maen, East of Newbridge SINC</b>	Potential impacts from minor habitat loss along road margins/field boundaries following widening of road within SINC boundaries.	County	Adverse, temporary and permanent, probable and reversible in the short-medium term.	Not significant	Impacts associated with habitat loss not significant given limited potential loss. Any habitats lost would be reinstated upon completion of construction.
	Potential impacts from damage/ degradation/ disturbance of habitats within the SINC, given proximity of Proposed Development.		Adverse, temporary, probable and reversible in the short-medium term.	Not significant	Any habitats damaged would be reinstated upon completion of construction. ECMS and CEMP with protective measures to be implemented during construction.
<b>Pwllgwinau, East of Newbridge SINC</b>	Potential impacts arising from contaminated surface water runoff and pollution incidents during construction.	County	Adverse, temporary, probable and reversible in the short-medium term.	Not significant	ECMS and CEMP with protective measures to be implemented during construction.
<b>Coed Cil-Lonydd, East</b>	Potential impacts from damage/degradation/	County	Adverse, temporary, probable and reversible	Not significant	Any habitats damaged would be reinstated upon completion of construction. ECMS and CEMP with

<sup>30</sup> The importance of a receptor is defined using the criteria set out at section 8.8.3 according to its geographic scale of importance (Local, County, National and International).

<sup>31</sup> Impacts have been characterised with reference to CIEEM Guidelines with due consideration to whether they are beneficial or adverse; extent; magnitude; duration; timing; frequency; and reversibility

<sup>32</sup> The significance of the environmental effects is based on the combination of the importance of a receptor and the nature of residual impacts following mitigation and is expressed at a geographic scale of reference in accordance with best practice.

<b>of Newbridge SINC</b>	disturbance of habitats within the SINC, given proximity of Proposed Development.		in the short-medium term.		protective measures to be implemented during construction.
<b>Gwydon Valley Woodlands, Abercarn SINC</b>	Potential impacts from damage/degradation/disturbance of habitats within the SINC, given proximity of Proposed Development.	County	Adverse, temporary, probable and reversible in the short-medium term.	Not significant	Any habitats damaged would be reinstated upon completion of construction. ECMS and CEMP with protective measures to be implemented during construction.
<b>Cwm Hafod-Fach Woodlands, North of Abercarn SINC</b>	Potential impacts from damage/degradation/disturbance of habitats within the SINC, given proximity of Proposed Development.	County	Adverse, temporary, probable and reversible in the short-medium term.	Not significant	Any habitats damaged would be reinstated upon completion of construction. ECMS and CEMP with protective measures to be implemented during construction.
<b>Craig Gwent Wood Ancient Woodland SINC</b>	Potential impacts from damage/ degradation/disturbance of habitats within the SINC, given proximity of Proposed Development.	County	Adverse, temporary, probable and reversible in the short-medium term.	Not significant	Any habitats damaged would be reinstated upon completion of construction. ECMS and CEMP with protective measures to be implemented during construction.
<b>River Ebbw SINC</b>	Potential impacts arising from contaminated surface water runoff and pollution incidents during construction.	County	Adverse, temporary, probable and reversible in the short-medium term.	Not significant	ECMS and CEMP with protective measures to be implemented during construction.
<b>Habitats</b>					
<b>Tree Lines and Hedgerows</b>	Potential impacts from loss/damage/degradation/disturbance to this habitat from	Local	Adverse, temporary and permanent, probable and irreversible in the short-medium term.	Not significant	Provision of new tree/shrub and hedgerow planting at a minimum ratio of three trees of a similar type planted for every one lost, and in respect of woodlands, at a planting rate of 1600 trees per hectare in respect of for

construction of the access route and turbines.

broadleaved woodland, and 2500 trees per hectare in respect of coniferous woodland, with sensitive design of access road and micro-siting of Turbines 2, 3 and 4 to minimise impacts to trees, woodland and their RPAs as far as possible. ECMS and CEMP with protective measures to be implemented during construction.

<b>Unimproved Acid Grassland</b>	Potential impacts from land-take causing damage/ loss to this habitat from construction of the access route and turbines.	Local	Adverse, temporary, probable and irreversible in the short-medium term.	Not significant.	Limited to minor loss and/or damage/degradation of this habitat associated with field F24 given proximity of access road. Any lost/degraded habitat to be reinstated upon completion and/or combined with enhancement of retained habitats to compensate for minor loss.
<b>Aquatic Features</b>	Potential impacts arising from contaminated surface water runoff and pollution incidents during construction.	Local	Adverse, temporary, probable and reversible in the short-medium term.	Not significant	ECMS and CEMP with protective measures to be implemented during construction.
<b>Protected Species</b>					
<b>Roosting Bats</b>	No trees confirmed to have roosting bats, but a number of trees with potential to support bats are present. Potential loss of bat roosts and killing/injury of bats if bats colonise these trees, as well as indirect effects on bats in other nearby roosts.	Local	n/a	Not significant	No bat tree roosts confirmed on-site; trees to be subject to an update inspection prior to any felling/tree works. Permanent, adverse, irreversible and long-term effects if a bat roost establishes at a later date. In this instance, removal of trees to be undertaken under an EPS licence with compensatory roosting features provided.
	No impacts anticipated to buildings B1 and B3 confirmed to each		n/a	Not significant	No impacts are anticipated to arise in respect of the occasional common pipistrelle roost supported by building B1 and B3 or in respect of other built structures

	support an occasional common pipistrelle day roost.				(B2 and B4) with potential to support roosting bats, given distance of these buildings from turbine locations.
	Indirect disturbance (particularly light spill) upon potential tree roosts and commuting/foraging habitat during construction.		Adverse, temporary, probable and reversible in the short-medium term.	Not significant	ECMS and CEMP and sensitive lighting strategy to be implemented during construction.
<b>Commuting and Foraging Bats</b>	Loss/ damage/ disturbance of habitat (mature trees) of value for foraging with disturbance/ fragmentation of dispersal routes across the Site.	Local	Adverse, permanent and temporary, probable and irreversible in the long term.	Not significant	Provision of new tree/shrub and hedgerow planting at a minimum ratio of three trees of a similar type planted for every one lost, and in respect of woodlands, at a planting rate of 1600 trees per hectare in respect of for broadleaved woodland, and 2500 trees per hectare in respect of coniferous woodland, with sensitive design of access road and micro-siting of Turbines 2, 3 and 4 to minimise impacts to trees, woodland and their RPAs as far as possible. ECMS and CEMP with protective measures to be implemented during construction
	Indirect disturbance (particularly light spill) upon potential tree roosts and commuting/foraging habitat during construction.		Adverse, temporary, probable and reversible in the short-medium term.	Not significant	ECMS and CEMP and sensitive lighting strategy to be implemented during construction.
	Potential for killing/injury of bats commuting and foraging within and through the Site during operation.		Adverse, permanent, probable and irreversible in the long term.	Not significant	CMMS to include feathering of blades and curtailment of turbines at wind speeds below 6.5 metres per second. Micro-siting of Turbines 2, 3 and 4 to minimise as far as possible the extent of overlap of existing trees and woodland habitat occurring within the bat habitat buffer of these turbines. Felling of trees/woodland habitat where necessary to ensure a 50m offset from the blade tip to nearest bat habitat feature, with compensatory planting undertaken on-site, at a minimum ratio of three trees of a

similar type planted for every one lost, and in respect of woodlands, at a planting rate of 1600 trees per hectare in respect of for broadleaved woodland, and 2500 trees per hectare in respect of coniferous woodland. Alternatively, curtailment of all/some of these turbines will be undertaken, with curtailment programmed to occur between sunset and sunrise during the months of May-September when temperatures rise above 7°C, and when windspeeds drop below 6.5 m/s (measured at nacelle height), so as to minimise impacts to bats potentially utilising the surrounding habitat features. Monitoring of effectiveness will also be undertaken to further prevent fatalities and prevent significant adverse impacts on local bat populations.

<b>Great Crested Newt</b>	Loss of suitable habitat between 50m and 500m of breeding ponds.	Local	Adverse, permanent and temporary, certain and reversible in the short-medium term.	Not significant	Any habitats lost would be reinstated upon completion of construction with enhancement of habitat within 50m of breeding ponds. ECMS and CEMP with protective measures to be implemented during construction.
	Potential killing/ injury during habitat clearance and construction works.		Adverse, permanent, probable and irreversible in the short-medium term.	Not significant	Translocation of a GCN population within 250m of breeding ponds from the construction footprint to a receptor site. Habitat manipulation during vegetation clearance to prevent killing/injury of GCN.
	Pollution of waterbodies supporting breeding populations.		Adverse, temporary, probable and reversible in the short-medium term.	Not significant	ECMS and CEMP with protective measures to be implemented during construction.
	Loss of breeding ponds P2 and P7 where abstraction/drainage of adjacent habitats is proposed to facilitate construction.		Adverse, temporary, probable and reversible in the short-medium term.	Not significant	New pond creation in compensation for temporary loss with enhancement of adjacent terrestrial habitat. Reinstatement of ponds upon completion of construction with enhancement of habitat within 50m of breeding ponds.

**Common  
Reptiles**

Loss of suitable habitat.  
Potential killing/ injury  
during habitat clearance  
and construction works.

Site

Adverse, temporary,  
probable and reversible  
in the short-medium  
term.

Not significant

ECMS and CEMP with protective measures to be  
implemented during construction.

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## 8.12 Additional Measures

- 8.12.1 The CMMS will allow for the mitigation measures (e.g., curtailment) to be adapted as monitoring surveys are undertaken. If the original mitigation measures are found to not be as effective as anticipated, the CMMS allows for additional mitigation measures to be employed (e.g., additional curtailment at different times of year or during a wider range of weather conditions). Similarly, where monitoring has identified a reduction in bat activity at the Site following construction of the turbines, the level of curtailment could potentially be reduced. As such, no additional measures are deemed required.

## 8.13 Residual Effects Assessment

- 8.13.1 Following compliance with the CMMS and adaptation to include additional curtailment of the turbines, the risk of killing bats will be reduced.

## 8.14 Further Work to be Undertaken

- 8.14.1 This section describes the further work to be undertaken to support the biodiversity assessment presented in the ES.

### Baseline

- 8.14.2 Further bat tree inspections will be undertaken prior to any works required to trees previously confirmed to have bat roost potential. Update inspections will be completed to reconfirm the potential of such features to support roosting bats as well as determining the presence/likely absence of any bat roosts which may have established during the interim period, to determine the need for an EPS Development Licence from NRW prior to commencement of works in respect of turbine construction.
- 8.14.3 Further geo-environmental ground investigations will be undertaken to determine groundwater levels surrounding Turbine 3 in respect of identifying whether waterbody P3 is fed entirely, or in part, but groundwater. Confirmation of hydraulic connectivity (or otherwise) between waterbody P3 and this turbine location will determine the extent of impact arising upon waterbody P3 as a result of turbine foundation excavations, necessary to inform those required mitigation measures regarding great crested newt in respect of a future EPS Development Licence from NRW.

### Assessment

- 8.14.4 As part of the CMMS, the impacts of the turbines on bats and the effectiveness of the feathering and curtailment measures will be continually assessed, with additional mitigation measures included if deemed appropriate. This will serve to prevent killing of bats due to barotrauma from the turbines.

### Environmental Measures

- 8.14.5 As set out above, continual monitoring as part of the CMMS will inform any further mitigation that may be required during the operational phase.