Technical Appendix 2A: Ecological Assessment

Penpergwm Solar Farm

23/06/2021

Disclaimer

Neo Environmental Limited shall have no liability for any loss, damage, injury, claim, expense, cost or other consequence arising as a result of use or reliance upon any information contained in or omitted from this document.

Neo Environmental Ltd	
Head Office - Glasgow: Wright Business Centre, 1 Lonmay Road, Glasgow. G33 4EL T 0141 773 6262 E: info@neo-environmental.co.uk	
Warrington Office: Cinnamon House, Crab Lane, Warrington, WA2 0XP. T: 01925 661 716 E: info@neo-environmental.co.uk	**Rugby Office:** Valiant Suites, Lumonics House, Valley Drive, Swift Valley, Rugby, Warwickshire, CV21 1TQ. T: 01788 297012 E: info@neo-environmental.co.uk
Ireland Office: Johnstown Business Centre, Johnstown House, Naas, Co. Kildare. T: 00 353 (0)45 844250 E: info@neo-environmental.ie	**Northern Ireland Office:** 83-85 Bridge Street Ballymena, Co. Antrim BT43 5EN T: 0282 565 04 13 E: info@neo-environmental.co.uk

Prepared For:

Great House Energy Centre Ltd

Prepared By:

Daniel Flenley BSc (Hons) MPhil MCIEEM

Alex Wilson BSc (Hons) PhD MCIEEM

Dara Dunlop BSc (Hons)

	Name	Date
Edited By:	Daniel Flenley	16/04/2021
Checked By:	Nicole Beckett	16/04/2021
	Name	**Signature**
Approved By	Paul Neary	

Contents

Executive Summary 6
Introduction 7
Consultation 10
Legislation and Planning Policy Context 13
Methodology 21
Baseline Conditions 27
Impact Assessment 41
Cumulative Effects 60
Conclusion 61
Appendices 66

STATEMENT OF PURPOSE

This draft Ecological Assessment is being published to accompany pre-application consultation carried out under Articles 8 and 9 of the Development of National Significance (Procedure) (Wales) Order 2016. The formal pre-application consultation runs until 25th August 2021. This report is to be read in conjunction with the accompanying reports and plans:

- *Volume 2: Planning Application Drawings*
- *Volume 3, Technical Appendix 1A: Landscape and Visual Appraisal*
- *Volume 3, Technical Appendix 1B: Green Infrastructure Strategy*
- *Volume 3, Technical Appendix 2B: Ecological Design Strategy ("EDS")*
- *Appendix 2.1: Bat survey report*
- *Appendix 2.2: Great crested newt ("GCN") survey report*
- *Appendix 2.3: Protected species survey summary and assessment*

EXECUTIVE SUMMARY

2.1. An Ecological Assessment has been undertaken for a proposed solar farm and associated infrastructure (the "Proposed Development") on land 0.5km north of Penpergwm and c. 3.9km southeast of Abergavenny, Monmouthshire. This is to assess the potential impacts on local ecology as a result of the Proposed Development. Baseline information within the ecological assessment comprises an initial desk-based assessment and an extended phase 1 habitat survey, which have been outlined within the relevant sections of this report.

2.2. The desk-based assessment identified that within 15km of the Application Site boundary there are six internationally designated sites: all Special Areas of Conservation ("SACs"). The closest of these is River Usk SAC, located 0.86km south-southwest of the Application Site. There are eight Sites of Special Scientific Interest ("SSSIs") within 5km of the Application Site.

2.3. These designated sites have been assessed below. There will be **no adverse effects** on the integrity of any statutory designated sites as a result of the Proposed Development.

2.4. The only designated sites with connectivity to the Application Site are the River Usk SAC and the River Usk (Lower) and the River Usk (Upper) SSSIs. With the implementation of the recommended measures, it has been determined that there will be **no significant adverse effects** on any designated nature conservation site as a result of the Proposed Development.

2.5. A total of 14 habitat types were noted within the Ecological Study Area ("ESA") during the extended phase 1 habitat survey undertaken in June 2020. During the survey visits, these habitats were assessed for their potential to support protected and notable species. Overall, the current site is considered to be of **relatively low ecological interest** in terms of habitats.

2.6. The construction of the Proposed Development will occur primarily over land which has been identified primarily as Improved Grassland habitat. From the survey findings and impact assessment conducted it is considered that the Proposed Development is **likely to have no significant adverse effects** on local wildlife. However, precautionary and mitigation measures have been outlined within this report to reduce any potential for effects upon local ecology.

2.7. Furthermore, an Ecological Design Strategy ("EDS") has been produced. This encompasses enhancement and compensatory measures to ensure the proposed solar farm will lead to a **net gain** for local wildlife and ecosystem services (see **Technical Appendix 2B**).

INTRODUCTION

Background

2.8. Neo Environmental Ltd has been appointed by Great House Energy Centre Ltd (the "Applicant") to complete Environmental Assessments for a solar farm and associated infrastructure (the "Proposed Development") on land 0.5km north of Penpergwm and c. 3.9km southwest of Abergavenny, Monmouthshire (the "Application Site").

2.9. Please see **Figure 4 of Volume 2: Planning Application Drawings** for the layout of the Proposed Development.

2.10. An Ecological Design Strategy ("EDS"; **Technical Appendix 2B**) bat survey report (**Appendix 2.1**), great crested newt ("GCN") survey report (**Appendix 2.2**), and protected species survey summary and assessment (**Appendix 2.3**) have also been prepared for the Proposed Development. These should be read in conjunction with this Ecological Assessment.

Development Description

2.11. The Proposed Development consists of the construction of a 40MW solar farm and will comprise PV panels mounted on metal frames, inverter and transformer units, new access tracks, underground cabling, perimeter fencing with CCTV cameras and access gates, a temporary construction compound and all ancillary grid infrastructure and associated works.

Site Description

2.12. The Application Site is located on land 0.5km north of Penpergwm and c. 3.9km southeast of Abergavenny, Monmouthshire; the approximate centre point of which is Grid Reference E332954, N211435. Comprising 14 agricultural fields, the Application Site measures 70.03 hectares (ha) in total with only c. 17.61 hectares of the landscape under the solar arrays themselves. See **Figure 4 of Volume 2: Planning Application Drawings** for details.

2.13. Land within the Application Site itself is undulating, ranging between 61 – 140m Above Ordnance Datum (AOD) and consists of fields typically of medium scale, bound by a mixture of grassy field margins, semi-mature hedgerows, and intermittent trees (see **Figure 3 of Volume 2: Planning Application Drawings** for field numbers).

2.14. The Application Site is in an area with existing electricity infrastructure with a pylon line crossing Field 3 to the north and running in a north – south direction between Fields 6 and 7 and to the west of Field 8.

2.15. The local area is largely agricultural in nature, punctuated by individual properties and farmsteads; the nearest residential areas are the villages of Penpergwm and The Bryn; located 0.5km and 0.9km north respectively. Recreational Routes include two Public Rights of Way

(PRoW) which pass through Fields 8, 9, 10 and 11 in the southern section of the site and an Other Route with Public Access (ORPA) which passes from Great House along the eastern boundary of Field 14 and through the treeline on the southern border of Fields 5, 6 and 7. Another PRoW passes along the northern boundary of Fields 1, 3 and 4.

2.16. While there are a number of drains and watercourses throughout the Application Site, including a small tributary of the Ffrwd Brook bordering Field 11, the site is entirely contained within Flood Zone A, an area described as having a "*Low probability*" of flooding.

2.17. The Application Site will be accessed via an improved farm access situated on the southern boundary. Traffic will approach the site entrance from the south using a local road from Penpergwm for approximately 800m. Traffic will be routed to Penpergwm from the north via the B4598. This road connects to the strategic road network south of Abergavenny at the A40 / A465 interchange.

Scope of the Assessment

2.18. An Ecological Assessment of the Application Site has been completed to inform the submission of a planning application to the Planning Inspectorate ("PINS") Wales. This report follows a similar format to an Ecological Impact Assessment ("EcIA"), and aims to:

- Determine the main habitat types within and immediately adjacent to the Application Site in relation to the Proposed Development footprint;
- Identify any actual or potential habitat or species constraints pertinent to the development of the Application Site and to identify how the Proposed Development can avoid, mitigate and, if necessary, compensate for impacts on these actual or potential constraints;
- Assess the potential impacts of the Proposed Development during the construction, operation and decommissioning phases;
- Provide mitigation to reduce the impacts of the activities undertaken during the various phases of the Proposed Development, and
- Identify potential opportunities for the Proposed Development to enhance and add to the biodiversity resource within the site.

Statement of Authority

2.19. The assessment has been conducted by ecologists registered with the Chartered Institute of Ecology and Environmental Management ("CIEEM"). Work has been carried out in line with

the relevant professional guidance: CIEEM's Guidelines for Ecological Impact Assessment in the UK and Ireland[1].

2.20. Daniel Flenley, a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM), has over 14 years of ecology experience including undertaking surveys and writing associated reports. Daniel has experience in undertaking and managing a range of surveys and assessments including EcIA, extended phase 1 habitat surveys and ornithological and protected species surveys, for circa 450 projects. These include a variety of development types such as energy, commercial, industrial and transport infrastructure. Daniel holds a GCN class licence and has worked as an accredited agent under bat and amphibian mitigation and reptile survey licences.

2.21. Alex Wilson is a full member of CIEEM and holds a PhD in visual constraints in bird behaviour. Experienced in undertaking ornithological surveys and bat surveys, Alex is a licensed bat and dormouse ecologist in England and Wales. She also holds a barn owl licence and acts as a supervisor and advisor to undergraduate and postgraduate ecological research projects. Alex is currently a Principal Ecologist at Wildwood Ecology.

2.22. Dara Dunlop is a Qualifying Member of CIEEM with circa three years' experience in the ecology sector, including working for an ecological consultancy, undertaking a range of protected species surveys and extended phase 1 habitat surveys for industrial schemes, and land management of designated sites. Dara has co-authored several reports including Ecological Impact Assessments and Protected Species Reports for various developments.

[1] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine.

CONSULTATION

2.24. The project team requested pre-application advice from Monmouthshire County Council in April 2020. A resultant meeting with Susan Hall (policy), Collette Bolsey (landscape), Amy Longford (heritage), Lowri Hughson-Smith (planning officer) and the biodiversity and highways officers of the Council was held on 29th June 2020. This highlighted that:

- Ecology reporting must take account of priority habitats in Wales under the Environment Wales Act 2016, and consider ecosystems resilience (diversity, extent, condition, connectivity and adaptability),
- No local-level designations were present within the site boundary, but there were a number of these within 5km,
- There were records of great crested newt to the northwest and southeast of the Application Site, which could create an opportunity to restore landscape for the species as an ecological enhancement; and
- A green infrastructure strategy and management plan should be submitted with the application.

2.25. A formal pre-application response was received in August 2020. Further to the above, this added the following comments on ecology:

"We […] expect consideration of whether any of the habitats or species on the development site would meet the criteria to achieve SINC value.

We would expect the development to consider opportunities to benefit ecosystem resilience.

Our experience with other DNS solar sites in Newport is that full bat surveys are undertaken due to the scale of the development and the resultant change to the natural landscape. It would be our advice as a consultee to the DNS that adequate bat survey in accordance with best practice is needed […]. Details including creation of access routes & lighting will be important in the consideration of the impacts on bats.

Planning Policy Wales (PPW) 10 sets out that "planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means that development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity" (para 6.4.5).

The application must consider the step wise approach (para 6.4.21) to ensure that the development meets the requirements of PPW 10.

[…] there is potential to improve the botanical value of the grassland on the site and provide biodiversity net benefit as part of the proposals. The retention and enhancement of the hedge lines, watercourses, waterbodies and woodland should be integrated into the design and opportunities such as provision of new ponds and green corridors through the site to improve habitat connectivity to the wider landscape should also be considered. Supplementary planting of existing hedgerows to improve connectivity and use of standard trees is recommended. Grassland restoration, use of conservation headlands and watercourse buffers would be beneficial.

Based on the scale of this development, it is recommended that an ecological design strategy is submitted with the application and is used to inform the Green Infrastructure information required by the MCC SPG.

There are likely to be priority habitats within and adjacent to the development site, the proposals will need to demonstrate that there will not be an adverse effect on these habitats in order to meet the first part of [Local Policy NE1].

The second part of the policy provides as follows: Where development is permitted, it will be expected that any unavoidable harm is minimised by effective avoidance measures and mitigation. Where this is not feasible appropriate provision for compensatory habitats and features of equal or greater quality and quantity must be provided.

It is recommended that a Construction Environmental Management Plan is secured as part of the approval to ensure adequate protection of biodiversity features such as watercourses, waterbodies, hedgerow & trees plus protected and priority species during construction and decommissioning.

An Ecological Impact Assessment (EcIA) in accordance with CIEEM guidelines must be undertaken and the findings of surveys and assessments must influence the design and layout of the scheme. [This] will include loss/gain analysis of the proposals identifying, quantifying and evaluating the potential effects of the development on priority habitats and protected and priority species and providing an appropriate mitigation/enhancement scheme in accordance with requirements under LDP Policy NE1 and PPW 10 (as above).

The EcIA shall be informed by the Preliminary Ecological Appraisal (PEA) including desk study (Local Record Centre search), habitat assessment and any necessary secondary surveys.

Surveys should be in line with:

- *British Standard BS42020:2013 Biodiversity – Code of Practice for Planning and Development,*
- *CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*
- *Bat Surveys should be undertaken in accordance with Collins, J. (ed.)(2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)"*

2.26. An Environmental Impact Assessment ("EIA") screening request for the Proposed Development was submitted to the Planning Inspectorate (PINS) Wales in October 2020. To help inform their direction, the Planning Inspectorate consulted with Annabelle Evans of Natural Resources Wales (NRW). The response (received on 12th November 2020) indicated that no EIA was necessary.

2.27. The ecology points arising from the consultation have been addressed through the following:

- Ecological surveys and assessments as detailed above, varied as follows:
  - An Ecological Assessment fulfilling the same essential functions as an EcIA;
  - Assessment is made against the more recent PPW 11, rather than PPW 10.
- Biodiversity net benefit demonstrated in an ecological design strategy,
- Details of a sensitive lighting scheme, which will be limited to emergency lighting,
- Construction Environmental Management Plan, and
- Long-term management secured via a Green Infrastructure Management Plan.

LEGISLATION AND PLANNING POLICY CONTEXT

International Legislation

2.28. International legislation relevant to the Proposed Development is outlined within **Table 2-1** below.

Table 2--1: Relevant International Legislation

Directive	Main Provisions
Bern Convention	The Bern Convention[2] came into force in 1982, with the principal aims to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix III.
Bonn Convention	The Bonn Convention[3] came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix I of the Convention), concluding multilateral Agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix II), and by undertaking cooperative research activities.
Ramsar Convention	The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)[4] came into force in 1975. It is an international treaty for the conservation and wise use of wetlands.

National Legislation

Wildlife & Countryside Act 1981 / Conservation of Habitats and Species Regulations 2017

2.29. The Wildlife and Countryside Act 1981[5] (as amended), formerly used to implement EU legislation, has more recently been strengthened by the Conservation of Habitats and Species Regulations 2017. This consolidates and amends existing national legislation, making it an offence to:

[2] Available at: https://www.coe.int/en/web/bern-convention

[3] Available at: https://www.cms.int/en/convention-text

[4] Available at: https://www.ramsar.org/about-the-convention-on-wetlands-0

[5] Parliament of the United Kingdom, 1981. Wildlife and Countryside Act 1981 (as amended). Available at: http://www.legislation.gov.uk/ukpga/1981/69

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

2.30. Section 41 of the Conservation of Habitats and Species Regulations 2017 states that planning policies should encourage the management of features of the landscape which:

"by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems of marking field boundaries) or their function as "stepping stones" (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species."

Environment (Wales) Act 2016

2.31. This Act[6] places a duty on planning authorities to have due regard for biodiversity and nature conservation during operations, ensuring that biodiversity is a key consideration in the Welsh planning process. Section 6 of the Act introduces a Biodiversity and Resilience of Ecosystems duty in this connection.

2.32. Under Section 7 of the Environment (Wales) Act, the Welsh authorities have published lists of habitats and species of principal importance for the conservation of biodiversity in Wales.

2.33. The Environment (Wales) Act 2016 also introduces Sustainable Management of Natural Resources ("SNMR") and sets out a framework to achieve this as part of decision-making. The objective of the SMNR is to maintain and enhance the resilience of ecosystems and the benefits they provide. NRW is required to produce Area Statements (see below) in connection with this.

Hedgerows Regulations 1997

2.34. Under the Hedgerows Regulations 1997, certain hedgerows[7] are classified as 'Important' based on factors such as the presence of a certain number of woody native plant species. Subject to certain exceptions, the removal of an 'Important' hedgerow is prohibited.

[6] Available at https://www.legislation.gov.uk/anaw/2016/3/contents
[7] Available at https://www.legislation.gov.uk/uksi/1997/1160/contents/made

2.35. 'Removal' includes uprooting all or part of the hedgerow, as well as any acts that could lead to the hedgerow's destruction. Removal is permitted under Section 6 of the Act under a small number of exemptions, including:

"for carrying out development for which planning permission has been granted or is deemed to have been granted, except development for which permission is granted by article 3 of the Town and Country Planning General Permitted Development Order 1995 in respect of development of any of the descriptions contained in Schedule 2 to that Order other than Parts 11 (development under local or private Acts or orders) and 30 (toll road facilities)."

Protection of Badgers Act

2.36. The Protection of Badgers Act 1992[8] makes it illegal to kill, injure or take a badger or to intentionally or recklessly interfere with a badger sett. Sett interference includes disturbing badgers whilst they are occupying a sett or obstructing access to it.

Planning Policy

Future Wales: The National Plan 2040

2.37. Future Wales is the Welsh national development framework, setting the direction for development to 2040. It is a development plan with a strategy for addressing key national priorities through the planning system.

2.38. Policy 9 of Future Wales safeguards areas for the purposes of improving the resilience of ecological networks and ecosystems services, to identify areas for the provision of green infrastructure and to secure biodiversity enhancement (net benefit). Further:

In all cases, action towards securing the maintenance and enhancement of biodiversity (to provide a net benefit), the resilience of ecosystems and green infrastructure assets must be demonstrated as part of development proposals through innovative, nature-based approaches to site planning and the design of the built environment.

2.39. Policy 17 (Renewable and Low Carbon Energy and Associated Infrastructure) states:

[Large-scale wind and solar] proposals should demonstrate that they will not have an unacceptable adverse impact on the environment. Proposals should describe the net benefits the scheme will bring in terms of social, economic, environmental and cultural improvements to local communities.

[8] Parliament of the United Kingdom (1992). Protection of Badgers Act 1992. Available at http://www.legislation.gov.uk/ukpga/1992/51/contents

2.40. Additionally, Policy 18 (Renewable and Low Carbon Energy Developments of National Significance) supports renewable development proposals that include biodiversity enhancement measures to provide a net benefit for biodiversity.

Planning Policy Wales 11 (2021)

2.41. Planning Policy Wales ("PPW") 11[9] sets out the government planning policies for Wales and how they should be applied. With regards to ecology and biodiversity, Chapter 6 (Distinctive and Natural Places) section 6.2 covers principles for integrating green infrastructure and development, and assessing green infrastructure. Section 6.4 covers biodiversity, ecological networks, designated sites, protected species, trees, woodland and hedgerows; this includes information on implementing the Environment (Wales) Act Section 6 Biodiversity and Resilience of Ecosystems duty.

2.42. Paragraph 6.4.3 states that planning strategies, policies and development proposals should:

- Safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, and
- Secure enhancement of, and improvements to, ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.

2.43. Paragraph 6.4.5 states that developments *"must provide a net benefit for biodiversity."*

2.44. Paragraph 6.4.21 sets out the stepwise process that planning authorities should follow to maintain and enhance biodiversity and build resilient ecological networks. This is done by ensuring that any adverse environmental effects are firstly avoided, then minimized, mitigated, and as a last resort compensated for. Enhancement must be secured wherever possible.

Technical Advice Notes 5 and 6

2.45. The Welsh Assembly Government has also issued a series of Technical Advice Notes ("TANs") to support Wales' national planning policy statements. Of these, TAN 5: Nature Conservation and Planning and TAN 6: Planning for Sustainable Rural Communities are relevant to the Proposed Development.

2.46. TAN 5 sets out key nature conservation principles for planning, and goes on to advise local authorities about development control and the safeguarding of designated sites and protected species.

[9] https://gov.wales/planning-policy-wales

2.47. In ecology terms, TAN 6 specifies the need for applications to include a baseline biodiversity assessment and a management plan to enhance important features.

The UK Post-2010 Biodiversity Framework

2.48. The UK Post-2010 Biodiversity Framework[10] was developed to covers the period from 2011 to 2020. It supersedes the former UK Biodiversity Action Plan ("BAP"), and is itself likely to be superseded by the Environment Bill[11] in 2021.

2.49. The Framework's first Implementation Plan was produced in November 2013. This was based on goals such as reducing direct pressures on biodiversity and promoting sustainable use, improving the status of biodiversity by safeguarding ecosystems, species and genetic diversity, and enhancing the benefits to all from biodiversity and ecosystems. The current EDS aims to demonstrate how the Proposed Development will assist in achieving this target.

Biodiversity Action Plans and the Biodiversity Duty

2.50. The UK Biodiversity Action Plan ("UKBAP"; 1994)[12] was organised to fulfil the Rio Convention on Biological Diversity in 1992, to which the UK is a signatory. Lists of national Priority species and habitats were produced, with all having specific action plans prepared to define measures required to ensure their conservation.

2.51. While the UKBAP has since been superseded by the UK Post-2010 Biodiversity Framework (see above), regional and local BAPs ("RBAPs" and "LBAPs") have been produced and remain in place. The Monmouthshire LBAP[13] seems largely to have been superseded by the Council's Forward Plan[14], developed to help fulfil its duty under Section 6 of the Environment (Wales) Act. The Plan contains a long list of Priority habitats including, among others, lowland beech and yew woodland, hedgerows, arable field margins rivers and ponds.

2.52. Several Priority species are also listed. Those relevant to the habitats within and adjacent to the Application Site include brown hare, hedgehog, dormouse, common and soprano pipistrelle, greater horseshoe bat, otter, skylark, common cuckoo, corn bunting, yellowhammer, tree sparrow, grey partridge, dunnock, turtle dove, song thrush, great crested newt, common toad, common frog and cornflower.

[10] Available at https://hub.jncc.gov.uk/assets/587024ff-864f-4d1d-a669-f38cb448abdc#UK-Post2010-Biodiversity-Framework-2012.pdf

[11] https://services.parliament.uk/bills/2019-21/environment.html

[12] Available at https://data.jncc.gov.uk/data/cb0ef1c9-2325-4d17-9f87-a5c84fe400bd/UKBAP-BiodiversityActionPlan-1994.pdf

[13] Available at: https://www.monmouthshire.gov.uk/countryside-services/biodiversity/

[14] Monmouthshire County Council (2017) Biodiversity and Ecosystem Resilience Forward Plan: Environment (Wales) Act 2016. Available at: https://www.monlife.co.uk/wp-content/uploads/2019/12/Biodiversity-Ecosystem-resiliance-forward-plan-1.pdf

Monmouthshire Council Local Development Plan 2011 - 2021[15]

2.53. Adopted in February 2014, this is the current Local Plan for Monmouthshire, the county in which the Application Site falls. The relevant policies set out within the Plan include the following ecological provisions. It is noted that these are broadly in keeping with the ecological aims and policies of Future Wales and PPW 11, against which the Proposed Development will be judged.

Policy S13: Landscape, Green Infrastructure and the Natural Environment

2.54. Policy S13 is a strategic, overarching policy concerning various ecology and landscape-related policy areas. Broadly speaking, it requires developments to protect and enhance various assets including green infrastructure, ecological connectivity, sites of nature importance and other biodiversity features.

Policy SD1: Renewable Energy

2.55. Policy D1 sets out criteria by which proposals for renewable energy schemes will be assessed. It states "*Renewable energy schemes will be permitted where:*

2) *There are no unacceptable adverse impacts on biodiversity […].*"

Policy SD4: Sustainable Drainage

2.56. Policy SD4 notes that "*Development proposals will be expected to incorporate water management measures, including Sustainable Urban Drainage Systems (SUDS), to reduce surface water run-off and minimise its contribution to flood risk elsewhere*."

Policy GI1: Green Infrastructure

2.57. Policy GI1 states the principles by which development proposals will be expected to maintain, protect and enhance Monmouthshire's diverse green infrastructure network.

Policy NE1: Nature Conservation and Development

2.58. Policy NE1 notes *"…applications must be accompanied by an ecological survey and assessment of the likely impact of the proposal on the species /habitats, and, where necessary, shall make appropriate provision for their safeguarding.*

Development proposals shall accord with nature conservation interests and will be expected to: i) Retain, and where appropriate enhance, existing semi-natural habitats, linear habitat features, other features of nature conservation interest and geological features and safeguard them during construction work;

[15]Available at: https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf

ii) Incorporate appropriate native vegetation in any landscaping or planting scheme, except where special requirements in terms of purpose or location may dictate otherwise;

iii) Ensure the protection and enhancement of wildlife and landscape resources by appropriate building design, site layouts, landscaping techniques and choice of plant species;

iv) Where appropriate, make provision for on-going maintenance of retained or created nature conservation interests."

Policy EP3: Lighting

2.59. This policy requires that development proposals are designed with an appropriate lighting scheme. Potential biodiversity impacts should be considered as part of this process.

South East Wales Area Statement

2.60. NRW policy relating to Monmouthshire includes consideration of the South East Wales Area Statement published subsequent to the Environment (Wales) Act 2016. A key theme is the linking of landscapes, going beyond the protection of existing wildlife sites:

"[…] identifying local opportunities for protected sites, and natural and built environments to contribute towards the resilience of wider priority habitat networks in the region. These opportunities for improving ecosystem resilience should support ecological connectivity between sites, across boundaries and at a landscape scale."

Guidance Documents

BS 42020:2013 Biodiversity

2.61. The British Standards Institute has published *BS 42020:2013 Biodiversity*[16]*. Code of Practice for Planning and Development* which offers a coherent methodology for biodiversity management. This document seeks to promote transparency and consistency in the quality and appropriateness of ecological information submitted with planning applications and applications for other regulatory approvals.

CIEEM Guidelines

2.62. CIEEM have produced guidance on Ecological Impact Assessment[17] and Ecological Report Writing[18]. EcIA is a process of identifying, quantifying and evaluating potential effects from activities such as those related to development on habitats, species and ecosystems. Its key elements include determining the matters to be addressed, collating baseline information on

[16] BS 42020:2013 Biodiversity. Code of practice for planning and development
[17] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Costal and Marine.
[18] CIEEM (2017) Guidelines for Ecological Report Writing

ecology in the absence of the proposed project, identifying important features and their geographical context, considering the legal and policy framework, assessing and characterising impacts and effects on these features, and incorporating measure to avoid, reduce and compensate for negative impacts and effects[19]. The CIEEM guidance explains each of these elements in turn, as well as other factors to consider in producing clear, concise and relevant reports.

[19] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Costal and Marine.

METHODOLOGY

Zone of Influence

2.63. Informed by the habitats present within the Application Site and the nature of the Proposed Development, the Zone of Influence (ZoI) is the area encompassing all predicted negative ecological effects from a Proposed Development. Due to the scale and nature of the Proposed Development, the study areas outlined in **Table 2-2 below** were considered appropriate for the gathering of information to inform the desk study. The ZoI will fall within the following radii for each of the ecological features.

Table 2-2: Study Areas for Ecological Features

ECOLOGICAL FEATURE	STUDY AREA
International statutory designations	15km
National statutory designations	5km
Non-statutory designations	2km
Protected and Priority species	2km
Extended phase 1 habitat survey	50m

Desk Study

2.64. A desk-based assessment was undertaken to collate available ecological information for the Application Site and the surrounding area. This included a search of statutory designated sites within a 5km radius of the Proposed Development, including: Special Protection Areas ("SPAs"), Special Areas of Conservation ("SACs"), Ramsar Sites, National Nature Reserves (NNRs) and Local Nature Reserves ("LNRs"). The description of each of these sites was obtained utilising the Multi-Agency Geographic Information for the Countryside ("MAGIC") website[20].

2.65. A data search was conducted through South East Wales Biodiversity Records Centre ("SEWBReC") to obtain information regarding protected/Priority species within 2km of the Application Site boundary.

[20] Available at - https://magic.defra.gov.uk/

Field Survey

Phase 1 Habitat Survey

2.66. A phase 1 habitat survey was undertaken on 18th June 2020 by Alex Wilson MCIEEM, an experienced ecologist. The ESA covered all land within the site boundary at the time, plus a 50m buffer around this area.

2.67. Due to later changes to the Application Site boundary, further phase 1 survey work was carried out by Daniel Flenley MCIEEM. This took place in late August 2020, alongside the bat survey detailed in **Appendix 2.1: Bat Survey Report**.

2.68. Survey work was carried out in accordance with the Joint Nature Conservation Committee (JNCC) guidelines (2010)[21] to produce an extended phase 1 habitat map. This habitat classification method provides a standardised system to record and map semi-natural vegetation and other wildlife habitats, in order to assess their potential importance for nature conservation.

Species Scoping Survey

2.69. The habitat surveyors also carried out a species scoping survey at the same time to identify the presence of protected species, or the potential of the Application Site to support protected species. The aim of the survey was to provide an overview of the Application Site and determine any further survey work required. **Table 2-3** below outlines the relevant habitat and field signs that indicate the potential presence of protected or Priority species within the ESA.

Table 2-3: Indicative Habitats and Field Signs of Protected Species

Taxon	Indicative Habitat(s)	Field Signs (In Addition to Sightings)
Bats	Roosts – trees, buildings, bridges, caves, etc. Foraging areas – e.g. parkland, water bodies, streams, wetlands, woodland edges and hedgerow. Commuting routes – linear features (e.g.) hedgerows, water courses, tree lines).	In or on potential roost sites: droppings stuck to walls, urine spotting in roof spaces, oil from fur staining round roost entrances, feeding remains (e.g. moth wings under a feeding perch).
Badger	Found in most rural and many urban habitats.	Excavations and tracks: sett entrances, latrines, hairs,

[21] JNCC (2010). Handbook for Phase 1 Habitat Survey

Taxon	Indicative Habitat(s)	Field Signs (In Addition to Sightings)
		well-worn paths, prints, scratch marks on trees.
Dormouse	Deciduous woodland, overgrown/species-rich hedgerows and associated scrub.	Nests, feeding remains (distinctively marked hazelnut shells).
Otter	Watercourses.	Holts (or dens), prints, spraints (droppings), slide marks into watercourses, feeding signs (e.g. fish bones).
Birds	Trees, scrub, hedgerow, field margins, grassland, buildings.	Nests, droppings below nest sites (especially in buildings of trees), tree holes.
Common reptiles	Rough grassland, log and rubble piles.	Sloughed skins.

Weather Conditions

2.70. Table 2-4 describes the weather conditions during the survey, giving temperature, wind, cloud cover and precipitation.

Table 2-4: Weather Conditions at Time of Survey

Temperature (°C)	Wind Force (Beaufort Scale)	Cloud Cover (%)	Precipitation
14	2-5	100%	Rain showers

Ecosystem Services Assessment

2.71. Impacts on ecosystem services have been assessed with the help of the solar park impacts on ecosystem services ("SPIES") decision support tool. This tool provides:

"an accessible, evidence-based assessment of the impacts of solar park management on biodiversity, natural capital and ecosystem services for the UK solar industry. The SPIES tool was co-developed by Lancaster University, the University of York and a broad cross-sectoral stakeholder group, including the National Solar Centre, the Solar Trade Association, the National Farmers Union, and those involved in solar park development, operation and maintenance, nature conservation bodies, land owners, and the farming community. The

SPIES tool was converted into a web-based app by Simomics and the project funded by the Natural Environment Research Council."

2.72. The input to the SPIES assessment included known site management practices at the present time, plus management actions during the operational phase of the Proposed Development. One area (timing of hedgerow management) was excluded from the assessment due to ambiguity in the current management regime. This is likely to have led to a negligible to minor underestimate of positive impacts during the operational phase. Impacts during the construction and decommissioning phase were assessed using proxies, as SPIES is focused on changes to management regimes.

Limitations

2.73. Results of the assessment undertaken by Neo Environmental are representative of the time that surveying was undertaken.

2.74. The absence of records returned during the data search does not necessarily indicate absence of a species or habitat from an area; rather, that these have not been recorded or are perhaps under-recorded within the search area.

2.75. An extended phase 1 habitat survey does not aim to produce a full botanical or faunal species list or provide a full protected species survey, but enables competent ecologists to ascertain an understanding of the ecology of the site in order to carry out a sufficient assessment of the Proposed Development. The absence of a particular species during a field survey does not necessarily mean it is wholly absent. Absence of a species during surveys may simply mean it could not be detected or was not using the site at the time the visit was undertaken. Likely absence may, however, be inferred from a combination of factors.

2.76. Whilst the survey was undertaken outside of the flowering season for some Priority plant species (e.g. bluebell), this was taken into consideration and vegetative signs were searched for.

2.77. The western boundary hedgerow to Field 2 (see **Figure 3 of Volume 2: Planning Application Drawings**) was only partially accessible due to the presence of livestock at the time of survey. However, the habitat type could still be ascertained, and it is expected that the species composition of the ground flora (less visible at distance) is similar to that of the other hedgerows within the Application Site.

2.78. Some badger field signs (e.g. tracks or pathways) may have been obscured by livestock trampling. However, this has not prevented an assessment of the suitability of the habitats present to support badgers.

2.79. At the time of the survey, access was only permitted within the landownership boundary. Parts of the adjacent land did fall within the ownership boundary. However, areas of land in the ESA that were not within the landownership boundary were viewed from field boundaries, with the use of binoculars, where needed. Given the habitats present across the landscape, it

is considered that the limited access to some areas of land directly adjacent to the Application Site has not impacted significantly upon the findings of the habitat or species scoping surveys.

Adopted Design Principles

2.80. Where possible, measures have been implemented as part of the iterative design process to prevent the Proposed Development affecting sensitive ecological features. The evaluation of the ecological baseline has enabled the inclusion of the following integral design measures:

- A 5m buffer from hedgerows
- 2m Buffer from Field Drains
- Tree Root Protection Zones avoided
- 10m Overhead Line (OHL) buffer
- Flood Zone
- 5m Public Right of Way (PROW) buffer (10m in total)

Impact Assessment

2.81. The impact assessment process involves:

- identifying and characterising impacts and their effects;
- incorporating measures to avoid and mitigate negative impacts and effects;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects;
- identifying opportunities for ecological enhancement.

2.82. The terms 'impact' and 'effect' are used commonly throughout ecological reports. Impact is defined as a change experienced by an ecological feature, while effect is defined as the outcome to an ecological feature from an impact. Impacts and effects can be positive, negative or neutral.

2.83. Assessment of potential impacts and effects needs to consider on-site, adjacent and more distant ecological features, including habitats, species and statutory and ecological

designated sites. This Ecological Assessment has been concluded by an experienced ecologist following CIEEM guidance[22].

Assessing the Magnitude of Change

2.84. Effect magnitude refers to the degree of change in the extent and integrity of an ecological receptor. Effects can be adverse, neutral or positive, and are judged in terms of magnitude in space and time.

[22] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Costal and Marine.

BASELINE CONDITIONS

Desk-based Study

Designated Sites

2.85. The Application Site does not lie within or adjacent to any statutory designated environmental sites.

2.86. Within 15km of the Application Site there are six internationally designated sites, all of which are Special Areas of Conservation ("SACs"). The closest of these is the River Usk SAC, located 0.86km south-southwest of Field 11 (see **Figure 3, Volume 2: Planning Application Drawings**). No Special Protection Area ("SPAs"), Ramsar Sites, possible SACs ("pSACs") or potential SPAs ("pSPAs") were recorded within 15km. There are eight Sites of Special Scientific Interest ("SSSIs") within 5km of the Application Site. No National Nature Reserves ("NNRs") or Local Nature Reserves ("LNRs") are present within 5km.

2.87. No non-statutory designated environmental sites are present within or adjacent to the Application Site. There are three Sites of Importance for Nature Conservation ("SINCs") within 2km of the boundary. The closest of these is Tyler's Wood SINC, located 0.33km south of Field 11.

2.88. Each of these sites are outlined in **Table 2-5** below. Statutory designations are detailed within **Appendix A, Figure 2.1** and non-statutory sites in **Appendix A, Figure 2.2**. The site descriptions and qualifying features are derived from the DBRC data search and the site citations available from JNCC[23] and MAGIC[24].

Table 2-5: Designated Sites

Site Code	Site Name	Qualifying Features	Distance & Direction	Connectivity with the Proposed Development Site
SAC (15km)				
UK0013007	River Usk SAC	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, sea lamprey	0.86km South-southwest	Hydrological, potential ecological

[23] Available at https://sac.jncc.gov.uk/

[24] Available at https://magic.defra.gov.uk/magicmap.aspx

		(*Petromyzon marinus*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), twaite shad (*Alosa fallax*), Atlantic salmon (*Salmo salar*), bullhead (*Cottus gobio*), otter (*Lutra lutra*), allis shad (*Alosa alosa*)		
UK0014784	Usk Bat Sites	Blanket bogs, *Tilio-Acerion* forests of slopes, screes and ravines, calcareous rocky slopes with chasmophytic vegetation, caves with no public access, degraded raised bogs, European dry heaths, lesser horseshoe bat (*Rhinolophlus hipposideros*)	4.37km Northwest	None
UK0030072	Sugar Loaf Woodlands SAC	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	5.26km Northwest	None
UK0030127	Cwm Clydach Woodlands SAC	*Asperulo-Fagetum* beech forests; Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)	9.90km West	None
UK0012766	Coed y Cerrig SAC	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	10.00km Northwest	None
UK0014794	Wye Valley and Forest of Dean Bat Sites	Lesser horseshoe bat (*Rhinolophlus hipposideros*), greater horseshoe bat (*Rhinolophus ferrumequinum*)	12.79km Southeast	None
SSSI (5km)				

33WEA	River Usk (Lower Usk)	River running over sandstones; otter (*Lutra lutra*); sea lamprey (*Petromyzon marinus*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), twaite shad (*Alosa fallax*), Atlantic salmon (*Salmo salar*), bullhead (*Cottus gobio*), allis shad (*Alosa alosa*); scarce higher plant species in tidal reaches	0.86km South	Hydrological, potential ecological
33WGQ	Penpergwm Pond	A pond situated in the Usk valley with hydrological links with the River Usk. The best example of a natural mesotrophic water body in the county with a diverse emergent flora and a number of national and county rarities including orange foxtail *Alopercurus aequalis*, lesser marshwort *Apium inundatum*, water purslane *Lythrum portula* and bladder sedge *Carex vesicaria*.	1.07km Southwest	None
33WBH	Cwm Mill Section, Mardy	An important geological death assemblage	4.21km Northwest	None
33WGK	Llanover Quarry	Senni Beds flora of presumed Seigenian age	4.30km Southwest	None
32WLM	River Usk (Upper Usk)	River running over sandstones; associated plant and animal communities including the nationally scarce mosses *Fissidens rivularis* and *F. rufulus*, otter, lesser horseshoe bat, water vole (*Arvicola amphibius*),	4.30km Northwest	Potential ecological

		white-clawed crayfish (*Austropotamobius pallipes*) and freshwater pearl mussel (*Margaritifera margaritifera*)		
33WFW	Coed-y-Person	Ancient semi-natural woodland. Rich ground flora south of canal including wood melick *Melica uniflora*, moschatel *Adoxa moschatellina* and woodruff *Galium odoratum*.	4.37km Northwest	None
33WFL	Blorenge	Sub-montane heath with large areas of *Calluna - Empetrum - Vaccinium vitis-idaea*; exposures of Carboniferous Limestone bearing a grassland rich in calcicole species	4.42km West	None
33WGT	Priory Wood	Ancient semi-natural woodland on the Silurian rocks of the Usk Inlier; rich ground flora in the east	4.99km Southeast	None
SINC (2km)				
n/a	Tyler's Wood	Ancient semi-natural woodland	0.33km South	None
WS/SO31/02	Cefynydd	Species-rich grassland; traditional orchards	1.51km Northeast	None
WS/SO30/03	Bottom Farm	Species-rich grassland	1.67km Southeast	None

2.89. Table 2-6 below summarises the most relevant protected, Priority and invasive non-native species recorded within the search area, and their potential to be present within the Application Site. Invasive non-native species are recorded in bold typeface.

Table 2-6: Summary of Biological Records

Species	Number of Records	Field Signs or Sightings within ESA	Potential for Species within Application Site
MAMMALS			
Hedgehog (*Erinaceus europaeus*)	17	No	Yes
Badger (*Meles meles*)	22	No	Yes
Otter (*Lutra lutra*)	18	No	Limited
Daubenton's Bat (*Myotis daubentonii*)	4	No	Yes
Brown Long-eared Bat (*Plecotus auritus*)	6	No	Yes
Greater Horseshoe Bat (*Rhinolophlus ferrumequinum*)	1	No	Yes
Lesser Horseshoe Bat (*Rhinolophlus hipposideros*)	14	Yes	Yes
Polecat (*Mustela putorius)*	17	No	Yes
AMPHIBIANS			
Common Frog *(Rana temporaria)*	11	No	Yes
Common Toad (*Bufo bufo*)	15	No	Yes
Great Crested Newt (*Triturus cristatus*)	5	No	Yes
REPTILES			
Grass Snake (*Natrix helvetica*)	4	No	Yes
BIRDS			
Barn Owl (*Tyto alba*)	26	No	Yes
Grey Partridge (*Perdix perdix*)	1	No	Yes
Common Cuckoo (*Cuculus canorus*)	5	No	Yes
Yellow Wagtail (*Motacilla flava*)	8	No	Yes
Turtle Dove (*Streptopelia turtur*)	1	No	Yes
Yellowhammer (*Emberiza citronella*)	2	No	Yes
Skylark (*Alauda arvensis*)	6	No	Yes
Tree Sparrow (*Passer montanus)*	3	No	Yes

Lapwing (*Vanellus vanellus*)	19	No	Yes
INVERTEBRATES			
Large Red-tailed Bumblebee *(Bombus lapidarius)*	8	No	Yes
White-tailed Bumblebee *(Bombus lucorum)*	2	No	Yes
Early Bumblebee *(Bombus pratorum)*	2	No	Yes
FLORA			
Cornflower (*Centaurea cyanus*)	1	No	Yes
Giant Hogweed *(Heracleum mantegazzianum)*	19	No	Yes
Himalayan Balsam *(Impatiens glandulifera)*	33	No	Yes
Japanese Knotweed *(Reynoutria japonica)*	13	No	Yes

Habitat Survey

2.90. The extended phase 1 habitat survey undertaken identified 14 habitat types within the ESA. Each of these is listed below, with the relevant Phase 1 code beforehand.

- A1.1.1 - Broadleaved Semi-Natural Woodland;
- A1.1.2 - Broadleaved Plantation Woodland;
- A2.1 - Scrub (Dense/Continuous);
- B4 - Improved Grassland;
- C3.1 - Tall Ruderal;
- G1 - Standing Water;
- G2 - Running Water;
- J1.1 - Cultivated/Disturbed Land – Arable;
- J3.6 - Buildings;
- J2.1.1 - Intact Hedge – Native Species-rich;
- J2.3.1 - Hedge with Trees – Native Species-rich;
- J2.4 - Fence;
- J2.6 - Dry Ditch, and

- J4 - Bare Ground.

2.91. A map of the habitats is given as **Figure 2.3, Appendix A**, with photographs in **Appendix B** of this report. The habitats are described in **Table 2-7** below, and the target notes referred to in **Figure 2.3** are detailed in **Table 2-8**.

Table 2-7: Habitat Descriptions

Habitat Code and Type	Description	Species Present
A1.1.1 - Broadleaved Semi-Natural Woodland	Pockets of woodland are found to the western part of the site, alongside Field 5, and forming part of the field boundary. In addition, there is woodland running along the stream corridor to the north of the site, again forming the boundary of Fields 3 and 4, and to the southeast corner of Field 4.	Pedunculate oak, alder, elder, hazel, ash, holly, bramble, hawthorn, blackthorn, rose sp., field maple, sycamore.
A1.1.2 - Broadleaved Plantation Woodland	Two small areas of planted woodland are found to the east of the site, along the eastern boundary of Field 5.	Hawthorn, cherry, hazel, elder, ash, field maple.
A2.1 - Scrub (Dense/Continuous)	Scrub is found alongside the woodland areas, as understorey, as well as in patches on the southern boundary of Field 4.	Bramble, cherry laurel, common nettle, buddleia, willow sp., blackthorn, hazel, hawthorn.
B4 - Improved Grassland	One of the dominant habitats onsite. Sheep- and cattle-grazed improved fields are in part poached, especially around gateways. Swards are relatively short in the fields with animals within them, and much longer (potentially to be cut for hay) in others.	White clover, creeping buttercup, sow-thistle sp., perennial rye grass, greater plantain, pineappleweed, redshank, annual meadow grass, selfheal, ragwort, common nettle, yarrow, cocksfoot, Yorkshire fog, daisy, dandelion, scentless mayweed.
C3.1 - Tall Ruderal	Small areas of this habitat are found associated with the western edge of Field 5.	Common nettle, hogweed, bramble, cocksfoot.

G1 - Standing Water	There are several ponds onsite or adjacent to the site. These appear to have low value for use by GCN (see **Appendix 2.2: Great Crested Newt Survey Report**).	Elder, buddleia, ash, holly, hazel, pendulous sedge, rush sp., soft rush, yellow flag, willow sp., hogweed, broad-leaved dock, ragwort, bramble.
G2 - Running Water	A drain is found running along the northern boundary of the site, running east into Ffrwd Brook. A second ditch with water runs south from Great House along the western edge of Field 10, before turning eastwards to follow the southern boundary of the same field. This also contributes to Ffrwd Brook.	Hemlock water dropwort, hogweed, pendulous sedge, nettle, alder, hazel, willow sp., buddleia, mare's tail.,
J1.1 - Cultivated/Disturbed Land – Arable	Fields 4, 8 and 11 are noted to be used for arable crops. The western boundary edge (along a bank) has a slightly more diverse mixture.	Crops species, with western edge of field 8 also containing selfheal, common bird's-foot trefoil, ragwort, common nettle, crested dogstail, yarrow, red clover, lesser trefoil, cocksfoot.
J3.6 - Buildings	There are several buildings within the local area, including those of Great House, as well as an animal shelter within Field 3.	-
J2.1.1 - Intact Hedge – Native Species-rich	Most of the vegetated boundaries onsite are of this type. Their management is variable, with some areas having had prior coppicing and management, and others undergoing regular cutting.	Honeysuckle, hazel, hawthorn, blackthorn, ash, bramble, common nettle, foxglove, elder, dogwood, field maple, hedge bindweed, alder, pedunculate oak, hogweed, sycamore, hedge woundwort, spear thistle, rose sp, woody nightshade, white bryony, broad-leaved dock, red campion, hedge bindweed, holly, common figwort, osier, garlic mustard.
J2.3.1 - Hedge with Trees – Native Species-rich	Whilst there are trees scattered sporadically along most of the hedgerows, there are also more obvious trees within a	Honeysuckle, hazel, hawthorn, blackthorn, ash, bramble, common nettle, foxglove, elder, dogwood, field maple, hedge

	hedgerow between Fields 1 and 2.	bindweed, alder, pedunculate oak, hogweed, sycamore, hedge woundwort, spear thistle, rose sp, woody nightshade, white bryony, broad-leaved dock, red campion, hedge bindweed, holly, common figwort, osier, garlic mustard.
J2.4 - Fence	Post and wire fences are present across the site, demarking field boundaries and providing stock-proofing.	-
J2.6 - Dry Ditch	Several dry ditches are found running along field edges, with these noted to the south of Fields 6 and 7, and Fields 10 and 9.	-
J4 - Bare Ground	Sections around gateways and where high traffic volumes pass are bare, with an additional area of bare ground in Field 3, near to the western hedgerow.	-

Table 2-8: Target Notes

Target Note	Description
1	Poached ground area
2	Field margin present
3	Pockets of standing water within ditch
4	Potential Roost Features (PRFs) for bats
5	Rabbit warrens
6	Standing water

7	Brash pile
8	New fence (part of hedge removed)
9	Pylon
10	Double row of coppiced hazel and trees, with ditch
11	Vegetated island
12	Buildings with high bat roost suitability
13	Buildings with suitability for barn owl
14	Full access not possible due to livestock
15	Gappier elements to hedge

2.92. The main habitat present at the Application Site is improved grassland, which is abundant throughout the adjacent landscape. The fields within the Application Site are used for cattle grazing and growing crops.

2.93. The following Priority habitats (as referenced in Section 7 of the Environment (Wales) Act 2016[25]) are present within the ESA:

- Lowland mixed deciduous woodland;
- Hedgerows; and
- Ponds.

2.94. The Priority habitat 'Arable field margins' may also be present, though this habitat is defined in part by the management practices in use. This habitat is

"managed specifically to provide benefits for wildlife"[26,27]

[25] Available at: https://www.legislation.gov.uk/anaw/2016/3/contents/enacted

[26] UK Biodiversity Action Plan Priority Habitat Descriptions (2011) Available at: https://data.jncc.gov.uk/data/2728792c-c8c6-4b8c-9ccd-a908cb0f1432/UKBAP-PriorityHabitatDescriptions-Rev-2011.pdf

[27] Wales Biodiversity Partnership (2021) Environment (Wales) Act. Available at: https://www.biodiversitywales.org.uk/Environment-Wales-Act

which is not the case at the Application Site.

2.95. Overall, the site itself is considered to be of relatively low intrinsic ecological value in terms of habitats. The primary habitat interest derives from the presence of species-rich hedgerows and ponds.

2.96. Suitable potential habitat within and adjacent to the survey area is present for otter, badger, dormouse, bats, hedgehog, brown hare, harvest mouse, amphibians and reptiles, breeding and wintering birds and invertebrates.

2.97. No invasive plant species included in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were noted onsite. Some cherry laurel (a less problematic invasive non-native species) is associated with the northern drain.

Species Scoping Survey

Bats

2.98. The hedgerows, scrub, running and standing water within the Application Site and the woodland adjacent to the site provide foraging and/or commuting features for bats. These features are largely unlit, being screened from lighting associated with nearby houses, farm buildings or roads. The majority of the site is improved grassland and arable land, offering more limited foraging interest.

2.99. There are a number of trees and structures around the site that offer good roosting suitability for bats. The adjacent Great House farm buildings offer excellent opportunities for bats to roost. Several of the older trees around the site have fissures, crevices and features suitable for woodland or crevice-dwelling species of bat to use.

Otter

2.100. No evidence of otter was noted onsite during the survey. However, it is considered that occasional otter presence along the drain north of Fields 1, 3 and 4 is likely. The dense vegetation along the Application Site's northern boundary, along with some connected hedges, woodland and ditches means that there are suitable terrestrial habitats for otter to use.

2.101. It is unlikely that the Application Site will support natal use. Whilst otters do use more remote and secluded sites for rearing young, the site does not offer optimal rearing habitats (due to disturbance from livestock, farm activities and lack of access to food-rich pools). The site is also some way from the main course of the River Usk and whilst this does not preclude use, there are higher quality habitats, with denser woodland for natal holts, closer to the river.

Badger

2.102. No definitive evidence of badger was noted onsite, with no latrines, setts, hairs, distinctive scent or snuffling observed. The woodland and scrub within the ESA provide sett-building habitat for this species, while all the terrestrial semi-natural habitats within the Application Site offer foraging opportunities.

2.103. It is very likely that badger is present in the local area, and uses the site from time to time either to forage or to cross to other foraging grounds.

Dormouse

2.104. No signs of dormice such as discarded hazelnut shells were noted during the survey. However, this is not unexpected given the low density and nocturnal nature of this species, and the fact that the survey was not specifically for dormice.

2.105. The boundary hedgerows and woodland offer good resources for dormice, with a range of foodplants present to support this species year-round. There are some gappy areas of hedge, though these would not be un-traversable for dormice. Moreover, there are alternative dormouse commuting routes around the local area, meaning that the gaps are not likely to be barriers.

Other Mammals

2.106. The hedgerows, scrub and improved grassland within the Application Site and the adjacent woodland provide suitable habitat for hedgehog. Whilst no signs of hedgehogs were found onsite, the hedges and vegetated boundaries offer good foraging areas and linkages for dispersal to the wider local area. Hedgehog is a UK Priority species[28].

2.107. No signs of other protected mammal species were recorded during the survey.

2.108. Rabbit warrens were recorded in the south and east of the Application Site, and common small mammal species may also use the habitats within the site. However, the presence or potential presence of these species is considered to be of limited nature conservation interest.

Amphibians

2.109. The Application Site was assessed for its suitability to support great crested newt and other amphibians. Further details can be found in **Appendix 2.2: Great Crested Newt Survey Report.**

[28] See https://hub.jncc.gov.uk/assets/98fb6dab-13ae-470d-884b-7816afce42d4

Reptiles

2.110. The Application Site contains opportunities for reptiles, particularly at edges between longer and shorter grass swards. The grasslands with longer sward height offer opportunities for foraging and refuge, whilst the more exposed bare and shorter-grazed areas offer insolation opportunities. The wooded areas and hedges also offer good opportunities for brumation/hibernation. The brash pile mentioned above may also offer refuge, though its newness and location within the shorter sward means it is only likely to be used opportunistically.

2.111. The habitats present, and the management of these, mean that it is likely that any reptile population will be of low density, with species likely to be restricted to slow worm, common lizard and grass snake. Their presence in a particular area at a given time is also likely to depend on the management at that time.

Birds

2.112. The open grassland within the Application Site may be used by species such as skylark, though no evidence of skylark presence was noted during the survey. With the presence of larger structures (pylons, trees) offering predator perches, and disturbance due to farm activity, the success of any such nests may be limited. Skylark is a UK red-listed[29] bird species, though still relatively common.

2.113. Bird species observed were predominantly associated with the scrub, hedges or wooded areas, which provide suitable nesting habitat for common species. Swallows and buzzard were observed overhead, with the former feeding on invertebrates over the Application Site and likely to nest within the agricultural buildings of Great House Farm. Waterfowl (such as Canada geese) observed in a pond in Field 5 may use the small island or woodland adjacent to the pond to nest.

2.114. The habitats within the Application Site are likely to support foraging barn owl, with the longer grassland sward being suitable for voles and other small rodents. The barns and farm buildings at Great House, along with other farms in the local area, may support breeding owls. Splash-like droppings were noted in the cattle shelter, which may indicate barn owl presence. However, no nest debris was noted in this structure.

Invertebrates

2.115. There are no notable plant species (e.g. devil's bit scabious, dog violet) within the ESA. Most plant assemblages were relatively poor in diversity and/or ability to support invertebrates, whether due to the flora present or to management (grazing/cuts). The more diverse areas of grassland and field margins are likely to support a more diverse invertebrate assemblage

[29] Eaton M.A. *et al.* (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746. Available online at britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf

(e.g. the bird's foot trefoil is likely to support a variety of bees), though these are likely to be common invertebrate species.

Fish

2.116. The drain to the north of the site is likely to have a variety of fish species using it. However, given the lack of any suitable habitats upstream for spawning (i.e. no obvious gravel beds are noted), it is unlikely that there is any use by salmon, trout, allis shad, twaite shad or lampreys. The other drains within the site are shallower and of less interest to fish.

Plants and Lichens

2.117. No plant (flowering or otherwise) of Priority or protected status was observed within the Application Site. No plant species of high biodiversity value were noted at the Application Site, whether in the margins or otherwise.

2.118. The management of the land within the ESA and surrounding landscape mean that species such as rarer lichens that are sensitive to fertilisers will not thrive.

Fungi

2.119. While the survey was undertaken outside of the main fungi fruiting season, the management of the Application Site at present does not support rarer grassland fungi. It is likely that the soil fertility is high, due to livestock presence and potential use of fertiliser. There are likely to be fungal populations within the adjacent wooded areas, especially where standing or decaying deadwood is present.

Other Species

2.120. No evidence of other protected or Priority species or invasive plant species was recorded during the surveys.

IMPACT ASSESSMENT

Best Practice Pollution Prevention Measures

2.121. Standard best practice pollution prevention measures will be adhered to, which will reduce the potential for impacts on ecology during the construction stage. As these are standard requirements, they are separate to mitigation measures (outlined later in this report).

2.122. Relevant measures include but are not limited to:

Pollution Prevention

- Hydrocarbons, greases and hydraulic fluids will be stored in a secure compound area;
- All plant machinery will be properly serviced and maintained, thereby reducing risk of spillage or leakage;
- All waste produced from construction will be collected in skips with the construction site kept tidy at all times;
- Excavated soil will be stored on site or removed by a licensed waste disposal unit;
- All materials and substances used for construction will be stored in a secure compound and all chemicals will be stored in secure containers to avoid potential contamination; and
- Location of spill kit to be known by all construction workers and implemented in the event of spillage or leakage.

Waste Management

- Skips are to be used for site waste/debris at all times and collected regularly or when full;
- All hydrocarbons and fluids are to be collected in leak-proof containers and removed from site for disposal or recycling; and
- All waste from construction is to be stored within the site confines and removed to a permitted waste facility.

Environmental Monitoring

- Contractor to nominate member of staff as the environmental officer with the responsibility to ensure best practice measures are implemented and adhered to, with any incidents or non-compliance issues being reported to project team.

Designated Sites

Statutory Sites

2.123. Within the potential ZoI of the Application Site, there are six Special Areas of Conservation ("SACs") and eight Sites of Special Scientific Interest ("SSSIs"). The River Usk SAC and River Usk (Lower Usk) SSSI are potentially connected to the Application Site via hydrological and ecological pathways (see below).

2.124. The River Usk (Upper Usk) SSSI has potential ecological connectivity with the Proposed Development through potential movement of otter. However, negligible hydrological connectivity exists with the Application Site. Field 11 drains into a small tributary that joins the Ffrwd Brook after circa 0.9km. The Ffrwd Brook then enters the River Usk circa 1.9km downstream. The SSSI is situated 11.9km upstream of the confluence of Ffrwd Brook and the Usk (i.e. 14.7km from site hydrologically). No significant hydrological influence would be expected this far upstream.

2.125. There is no connectivity between the Application Site and the Usk Bat Sites SAC. Lesser horseshoe bats, the only qualifying feature of the Usk Bat Sites SAC, have a core sustenance zone ("CSZ")[30] of 2km. Therefore, lesser horseshoes associated with the SAC are not expected to use the Application Site. The SAC is made up of several component bat sites, but the Application Site does not drain towards the SAC and lies downstream, on the opposite side of the Usk from the nearest component site.

2.126. The Sugar Loaf Woodlands SAC drains into the Usk upstream of the Application Site, as do Cwm Clydach Woodlands and Coed y Cerrig (both several km upstream). There is no connectivity between the Application Site and these three statutory designated sites.

2.127. Wye Valley and Forest of Dean Bat Sites SAC drains into the River Wye, which joins the River Severn upstream of the Usk. The CSZ of greater horseshoe bat[31], associated with this SAC, is 3km. However, the SAC is over 12km from the Application Site. Of all the species populations associated with the SACs and SSSIs, only otters associated with the River Usk designations are considered at all likely to make potential use of the Application Site.

2.128. Aside from the two River Usk SSSIs, all the remaining SSSIs except Priory Wood lie upstream of the Application Site. However, this woodland SSSI lies 0.22km east of the Usk and drains

[30] Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)
[31] Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)

into it rather than being directly hydrologically influenced by it. No ecological, ornithological or hydrological connectivity exists between the Application Site and Penpergwm Pond SSSI, Cwm Mill Section, Mardy SSSI, Llanover Quarry SSSI, Coed-y-Person SSSI or Blorenge SSSI.

2.129. As a result, it is considered that there are no pathways for potential impacts on 11 of the 14 statutory sites from the Proposed Development. These have therefore been dismissed from further assessment.

Non-statutory Sites

2.130. The three non-statutory Sites of Importance for Nature Conservation ("SINCs") present within 2km of the Application Site are all designated for habitats absent from the Application Site. No hydrological connectivity exists, as all three are located upstream of or away from the site drains, Ffrwd Brook and the River Usk. None of the SINCs are designated for mobile protected species. As a result, it is considered that there are no pathways for potential impacts on these sites from the Proposed Development. Non-statutory sites have therefore been dismissed from further assessment.

In the Absence of Mitigation

River Usk SAC and River Usk (Lower Usk) SSSI

2.131. A direct hydrological pathway exists between the Application Site and these two overlapping designated sites. Field 11 drains into a small tributary that joins the Ffrwd Brook after circa 0.9km. The Ffrwd Brook then enters the River Usk circa 1.9km downstream (i.e. 2.8km downstream of the Application Site).

2.132. This distance is also within the known range size of otters. Of the watercourses within and adjacent to Application Site, only the drain on the northern boundary is assessed as offering suitable habitat for otter, due to having sufficient water depth to provide cover and foraging opportunities. The remainder are considered of negligible interest for this species, being too shallow.

2.133. Potential ecological connectivity is restricted to otter only. The other mobile species associated with the SAC and SSSI (Atlantic salmon, allis shad, twaite shad, sea lamprey, river lamprey, brook lamprey and bullhead) all require stony or gravelly substrate in the upstream parts of their range[32,33,34,35]. The SAC / SSSIs population of these species are therefore almost certain to be absent from the watercourses in and adjacent to the Application Site.

[32] JNCC (n.d.) 1102 Allis shad *Alosa alosa*. Available at: https://sac.jncc.gov.uk/species/S1102/
[33] JNCC (n.d.) 1103 Twaite shad *Alosa fallax*. Available at: https://sac.jncc.gov.uk/species/S1103/
[34] Maitland, P.S. (2003) Ecology of the River, Brook and Sea Lamprey *Lampetra fluviatilis, Lampetra planeri* and *Petromyzon marinus.* Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.
[35] Tomlinson, M.L. & Perrow, M.R. (2003). Ecology of the Bullhead. Conserving Natura 2000 Rivers Ecology Series No. 4. English Nature, Peterborough.

2.134. Table 2-9 below details common water pollutants and their effect on the aquatic environment. The table has been adapted from Ciria guidance[36].

Table 2-9: Common Water Pollutants and their Effects on the Aquatic Environment

Common Water Pollutants	Adverse Effect on Aquatic Environment
Silt	Reduces water quality, clogs fish gills, covers aquatic plants, impacts aquatic invertebrates, leads to a reduction in prey for insectivorous/carnivorous species, leads to degradation of habitat
Bentonite (very fine silt)	Reduces water quality, clogs fish gills, covers aquatic plants, impacts aquatic invertebrates, leads to a reduction in prey for species including otter, leads to degradation of habitat
Cement or concrete wash water (highly alkaline)	Changes the chemical balance, is toxic to fish and other wildlife. This can lead to direct impacts for aquatic species, or indirect impacts through loss of prey resources
Detergent	Removes dissolved oxygen, can be toxic to wildlife present within the aquatic environment
Hydrocarbons (e.g. oil, diesel)	Suffocates aquatic life, damaging to wildlife (e.g. otters) and to water supplies including industrial abstractions
Sewage	Reduces water quality, is toxic to aquatic wildlife, and damages water supplies

2.135. The potential occurrence of these contaminants and their capability of affecting water quality has been considered during the various phases of the Proposed Development. Potential contaminants are capable of undermining water quality and impacting the qualifying species and habitats occurring within the ZoI of the Proposed Development.

2.136. The Proposed Development will incorporate Sustainable Drainage System ("SuDS") and flood prevention measures, in accordance with paragraph 6.6.18 of Planning Policy Wales 11 and policy SD4 of the Monmouthshire Council LDP. Such preventative measures (which are

[36] Ciria (2015) Environmental good practice on site guide, 4th edition

essentially mandatory for all developments within Wales, and therefore are not relied on as ecological mitigation) will have the effect of controlling the movement of surface waters within and from the Application Site. For further detail see **Technical Appendix 4: Flood Consequence Assessment and Drainage Strategy** in **Volume 3** of this application.

2.137. The Proposed Development will be subject to mandatory pollution prevention measures under the Control of Pollution Act 1974 (as amended)[37]. Measures have been included within the development design to prevent dust and other pollution entering the watercourse. The recommended **standard pollution prevention measures** can be secured through a suitably-worded planning condition requesting a Construction Environmental Management Plan (CEMP). An Outline CEMP (OCEMP) has been produced as part of this application (see **Technical Appendix 8: OCEMP** in **Volume 3** of this application).

2.138. A 2m buffer from field drains and avoidance of the flood zone has been incorporated into the design of the Proposed Development (i.e. not as mitigation). As a result of the development design and the implementation of the above measures, it is considered there will be no significant adverse effects upon otters or any other qualifying habitats or species through physical or chemical pollution.

2.139. Construction works will be temporary, and restricted to the daytime. Otters are nocturnal, and therefore unlikely to be using the site during the hours of construction. Disturbance through noise and vibration during this phase is therefore considered not to be significant.

2.140. During the construction phase, the Proposed Development could cause undue stress to otters if these animals are accidently trapped within any exposed excavations left overnight. It is therefore considered that, without mitigation, otters may suffer an effect of **low spatial** and **short-term temporal** magnitude due to the Proposed Development. Stress through trapping would be expected to last for a short duration (between one night and at the worst four days, e.g. if an otter became trapped over a long bank holiday weekend). However, it could lead to a longer-term effect on the fitness of an individual belonging to the SAC population.

2.141. During the operational phase, disturbance from mechanical farming activities will decrease. This will amount to a positive impact.

2.142. In the absence of mitigation, there will be a **minor adverse effect** upon a single interest feature of the SAC and SSSI (i.e. otter) as a result. This is not considered significant.

River Usk (Upper Usk) SSSI

2.143. The River Usk (Upper Usk) SSSI has potential ecological connectivity with the Application Site. However, this is again limited to otter only. As stated above, hydrological connectivity with the Application Site is considered negligible as the Upper Usk is situated several km upstream.

[37] https://www.legislation.gov.uk/ukpga/1974/40/part/III/crossheading/construction-sites

2.144. This SSSI is located further from the Application Site both by land (4.3km rather than 0.86km away) and, more pertinently, along watercourses (11.9km rather than 2.9km) than the River Usk (Lower Usk) SSSI. Likely impacts and effects on the SSSI's otter population are therefore expected to be similar to, but of lower magnitude than, those outlined above for the River Usk (Lower Usk) SSSI. The River Usk SAC overlaps both SSSIs, and otters using the Usk may well form a single population.

2.145. In the absence of mitigation, it is therefore considered there will be a minor adverse effect upon a single interest feature of the River Usk (Upper Usk) SSSI (otter) as a result. This is not considered significant.

Recommended Mitigation and Enhancement Measures

2.146. All excavations are to be covered or closed off securely at the end of each working day to prevent the accidental trapping of commuting otters.

2.147. Although not relied on as mitigation, the 2m drainage ditch buffer zones adopted for the Proposed Development during project design will be clearly demarcated on site.

2.148. As part of site management during the operational phase, a lower grazing density is proposed (see **Technical Appendix 2B Ecological Design Strategy**). Disturbance from livestock will therefore be reduced, leading to a positive effect on otters.

Residual Effects

2.149. With the implementation of the above mitigation measures and the ecological enhancements designed as part of the Proposed Development, adverse effects will be minimised, counterbalanced and/or outweighed by beneficial effects. It is therefore considered that, overall, the River Usk SAC, River Usk (Lower Usk) SSSI and River Usk (Upper Usk) SSSI will experience **no adverse effects** from the Proposed Development.

Habitats

In the Absence of Mitigation

2.150. The construction of the Proposed Development will occur over land which has been identified primarily as improved grassland and arable habitat. These are generally of low ecological value and currently offer limited potential to support wildlife. Only arable land, fence, improved and poor semi-improved grassland are present under the proposed solar panels.

2.151. A total of 10.6m of hedgerow (from a single specie-rich hedgerow with trees) is to be removed to create road access. Circa 58.1m of hedgerow will be realigned and a further 50.5m trimmed back to improve visibility along the road. Construction will not involve the removal of any other trees or sections of hedgerow.

2.152. The relatively minor extent of habitat loss in a local context where these habitats are frequent is **not considered to be significant** in terms of the Application Site's intrinsic habitat interest.

2.153. As part of the design proposals (rather than as ecological mitigation), hedgerow sections lost will be replaced with new native species-rich hedges. **Figure 1.26 of Technical Appendix 1** shows the location of the proposed planting. However, in the absence of mitigation, the hedgerow removal will still constitute loss of small amounts of a Priority habitat. This will lead to effects of low to negligible spatial and medium-term temporal magnitude, i.e. negligible to minor and not significant effects. These magnitudes have been assigned because the loss of hedgerow length will be much less than 10% and, although the new hedges will provide biodiversity benefits in the long term, it will be a number of years until they attain the value of the existing hedges.

2.154. The Proposed Development will be designed in such a way to avoid significant losses of agricultural land during the operational stage. The total ground disturbance area resulting from the Proposed Development is 21,953.28m^2 or circa **3.19%** of the Application Site area. Agriculture can continue on the remaining land.

2.155. The main habitat loss will occur under the Proposed Development footprint in regard to structures such as access tracks, cable trenches and hardstanding for buildings and inverters. Solar panels will be mounted on frames which will be pile driven into the ground in a similar way to fence posts, therefore limiting soil disturbance. The site can be fully restored upon the cessation of the solar farm.

2.156. With the implementation of the **Ecological Design Strategy** ("EDS"; **Technical Appendix 2B**), where new habitats will be created using native species appropriate to the Application Site, biodiversity value and green infrastructure linkages will increase. This is in line with **Future Wales policies 9, 17 and 18**, **paragraphs 6.4.3 and 6.4.5 of Planning Policy Wales 11**, and **Policies GI1, S13 and NE1 of the Monmouthshire Council Local Development Plan**.

2.157. It is therefore considered that the loss of habitat from the Proposed Development **will not be significant**.

Recommended Enhancement Measures

2.158. The proposed wildlife enhancements designed into the Proposed Development (see **Technical Appendix 2B: Ecological Design Strategy**) include the following habitat measures:

- Creation of new species-rich grassland, hedgerows, scrub and trees;
- Creation of habitat interest features for protected species (e.g., herptile hibernacula and dormouse boxes; see below).

Residual Effects

2.159. With the implementation of the Proposed Development's design measures, best practice measures implemented during the construction phase, and the habitat management outlined, there will be **beneficial effects** on habitats.

2.160. With the correct management in place during the 40-year lifespan of the Proposed Development, the potential of the Application Site to support wildlife is likely to be increased. The supporting **EDS** (see **Technical Appendix 2B**) outlines the management proposals to enhance the Application Site's ecological value and therefore increase its potential to support local wildlife. With the implementation of these proposed enhancement measures, it is anticipated there will be a **net gain for biodiversity and green infrastructure**, in line with Future Wales policies 9 and 18, paragraphs 6.4.3 and 6.4.5 of Planning Policy Wales 11 and policies GI1, S13 and NE1 of the Monmouthshire Council Local Development Plan. Landscape linkages will also be strengthened, in line with NRW's South East Wales Area Statement.

Protected and Notable Species

In the Absence of Mitigation

2.161. The sections below detail the potential impacts and effects in the absence of mitigation for protected and notable species during the construction phase (approximately six months) and operational phase (40 years) of the Proposed Development.

2.162. In accordance with CIEEM guidelines[38], the duration of disturbance during construction is considered to be **short term** for the species groups below (except invertebrates). All groups except invertebrates live for several years in the UK. However, it is noted that short-term impacts can lead to long-term effects if e.g. they cause breeding failure in a given year. Invertebrates are assessed in line with their specific life history characteristics.

Otter

2.163. Otter presence may well occur occasionally along the drain corridor north of Fields 1,3 and 4. However, in terms of the Application Site is considered likely to be limited to foraging, commuting and other non-breeding activities, and only in this immediate boundary area. In the absence of mitigation, minor impacts on individual otters during the construction phase and positive impacts during the operational phase are considered likely. The rationale for this is outlined above in connection with the River Usk SAC.

2.164. This would lead to a minor adverse effect upon any otter population using the site. This is not considered significant.

[38] CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Costal and Marine. Version 1.1.

Bats

2.165. There are a number of trees and structures around the site that offer good roosting suitability for bats. The adjacent Great House farm buildings offer opportunities for bats, including horseshoes, to roost. Several of the older trees around the site have fissures, crevices and features suitable for woodland or crevice-dwelling species of bat to use (see **Figure 2.3**).

2.166. The Application Site offers a number of optimal habitats for commuting and foraging bats overall, with good habitat connectivity both within the site and linking it to adjacent areas. Key habitat features include hedges, tree-lined stream corridors, and woodland.

2.167. Many species of bat in Wales commute and forage along linear features, such as a stream/river, hedgerow or woodland edge. However, on occasion they will cross open features (particularly true of species such as Leisler's bat (*Nyctalus leisleri*) that use strong echolocation).

2.168. It is noted that the agricultural land is a sub-optimal commuting and foraging feature for most bat species. Arable land offers sub-optimal foraging habitat for bat species due to limited prey abundance. The loss of this habitat under the Proposed Development footprint will not lead to a significant reduction in foraging habitat for local bats.

2.169. A minor loss of more suitable foraging/commuting habitat is predicted from the construction of the Proposed Development, 10.6m of hedgerow is to be removed, 58.1m of hedgerow is to be realigned and a further 50.5m trimmed to create road access.

2.170. Given the likely presence of foraging and commuting bats, there is potential for lighting used during construction to disturb bats. However, it is anticipated that there will be minimal need for construction lighting (if any), as the vast majority of works will be undertaken in daylight. During the winter months, some construction lighting may be needed, but bats are generally in hibernation during this period.

2.171. The completed development will only feature emergency lighting and motion-sensitive security lighting. This will be directed to where it is needed and will only operate when triggered due to an emergency (i.e., the Application Site will be unlit most of the time). Light spillage on bat habitats within and adjacent to the Application Site will therefore be negligible. This is in line with LDP Policy EP3.

2.172. Through the removal of agricultural machinery and crop treatments, the operational phase will lead to a decrease in disturbance below current levels. With the implementation of the supporting EDS (**Technical Appendix 2B**) and Green infrastructure Strategy (**Technical Appendix 1B**), which outline measures to increase the diversity of flora species within the Application Site, faunal diversity including prey species for foraging bats will also increase. Please note these measures are not provided by way of mitigation, but instead as an integral part of the design of the Proposed Development. It is therefore considered that the Proposed Development will have a **positive effect** on bats.

Badger

2.173. No clear evidence of badgers was recorded during surveys. However, badger is a highly mobile species and is known to be present in the local area. The species may therefore forage or commute through the Application Site.

2.174. If any badger setts have been excavated since the surveys, the construction phase of the Proposed Development has the potential to impact upon badger by causing disturbance or destruction to a badger sett. During the construction phase, the Proposed Development can also cause undue stress to badgers if these animals are accidently trapped within any exposed excavations left overnight.

2.175. Security fencing used at the Proposed Solar Farm will contain badger gates, on average every 30m, to allow continued potential for badger movement (see **Figure 9 of Volume 2: Planning Application Drawings**). This will prevent the Proposed Development affecting access to foraging areas within the Application Site that are part of a clan's territory. This measure has been designed into the development, and therefore is not relied upon as mitigation.

2.176. In the absence of mitigation, badger **may be significantly affected** by the Proposed Development. The loss of any newly-created sett would be classed as of **moderate to high spatial** and **long-term temporal** magnitude.

Dormouse

2.177. The boundary vegetation (hedgerows and woodland) offer good arboreal connectivity and a variety of food and nesting resources. However, no dormouse records were returned during the data search.

2.178. As part of design measures, with the additional effect of avoiding impacts on dormice, all hedgerows within and adjacent to the Application Site will be retained and buffered from development by 5m, with the exception of small breaks of up to 1.5m for security fencing, **10.6m of hedgerow** removal and 58.1m realignment.

2.179. The extent of potential dormouse habitat to be lost temporarily to the Proposed Development (a total of 10.6m of hedgerow is minor. As part of the design proposals (rather than as ecological mitigation), all hedgerow sections lost will be replaced with new native species-rich hedges.

2.180. Given the possible presence of dormice, there is potential for lighting used during construction to disturb the species. However, it is anticipated that there will be minimal need for construction lighting (if any), as the vast majority of works will be undertaken in daylight. During the winter months, some construction lighting may be needed. However, dormice are in hibernation, and therefore deep within winter nests in vegetation and less likely to be disturbed, during this period.

2.181. The completed development will only feature emergency lighting and motion-sensitive security lighting. This will be directed to where it is needed and will only operate when triggered due to an emergency (i.e., the Application Site will be unlit for the majority of the time). Light spillage on potential dormouse habitats within and adjacent to the Application Site will therefore be negligible. This lighting design is therefore in line with LDP policy EP3.

2.182. Through the removal of agricultural machinery and crop treatments, the operational phase will lead to a decrease in disturbance below current levels. The implementation of the supporting EDS (**Technical Appendix 2B**) and Green infrastructure Plan (**Technical Appendix 1B**), including measures to plant new dormouse habitat, erect dormouse nest boxes and increase the diversity of flora species including dormouse foodplants within the Application Site, will lead to **positive** effects on dormice. These measures are not provided by way of mitigation, but as an integral part of the Proposed Development design.

2.183. However, in the absence of mitigation, any dormice using the hedgerows could be injured or killed or disturbed by noise, dust and vibration during the construction phase. At worst, these combined impacts would lead to a significant adverse effect of low to moderate spatial and medium temporal magnitude (5 to 15 years) upon any dormouse population using the Application Site.

Other Mammals

2.184. The Application Site offers suitable sheltering / foraging habitat for hedgehog in the form of hedgerows, woodland and dense scrub.

2.185. Semi-improved grassland, hedgerow and scrub habitats within the site provide foraging and shelter opportunities for polecat.

2.186. The site also offers suitable habitat for brown hare (arable and grassland habitat) and harvest mouse (hedgerows, farmland and woodland edges), but none were noted on site or during the data search.

2.187. No signs of water vole were noted. The agricultural drainage ditches within the site are considered to offer at best limited opportunities for these species. **No significant effect** upon water vole is predicted.

2.188. No evidence of other protected or Priority mammals was noted within the Application Site. It is expected that an assemblage of common small mammal species is present.

2.189. There will be negligible loss and fragmentation to the arable, grassland, woodland and hedgerow habitats. Impacts on hedgehog, polecat brown hare and harvest mouse are therefore likely to be limited to dust, noise and vibration disturbance during the construction phase of the Proposed Development.

2.190. However, the current baseline includes periodic disturbance of a smaller but not incomparable magnitude from agricultural activities several times a year. The limited human disturbance during the operational phase (constituting activities such as security checks and

habitat management operations) will be an improvement on the current situation for these four species.

2.191. Security fencing used at the Application Site will contain badger gates (see **Figure 9 of Volume 2: Planning Application Drawings**) to allow continued movement by species such as hedgehog. This will prevent the Proposed Development affecting access to foraging areas within the site. This measure has been designed into the development, and therefore is not relied upon as mitigation.

2.192. **No significant effects** are anticipated upon polecat, brown hare or harvest mouse in the absence of mitigation.

2.193. Habitats will be significantly enhanced for hedgehog and common small mammals by the creation of new hedgerows and species-rich grassland as part of the proposed EDS (**Technical Appendix 2B: Ecological Design Strategy**). **Positive effects** are therefore anticipated for hedgehog in the absence of mitigation.

Herptiles

2.194. It is considered that great crested newt (GCN) is likely to be absent from the Application Site and therefore **will not be subject to adverse effects** (see **Appendix 2.2** for further information).

2.195. Suitable aquatic habitat for other amphibians within the ESA includes the small number of ponds and areas of slow-moving water within field drains. Hedges, marsh / grassland mosaics, scrub and woodland habitats present within the site all offer suitable terrestrial habitat for amphibians.

2.196. The habitats present, and the management of these, mean that it is likely that any reptile population will be low density, with species likely to be restricted to slow worm, common lizard and grass snake. Suitable habitat for reptile includes habitat edges, wooded areas and hedges.

2.197. No development will occur in the majority of these habitats. However, the removal of hedgerow sections at any time of year could lead to disturbance, injury or mortality of sheltering herptiles. Any herptiles using ditches crossed by the proposed access track and/or security fencing may also be disturbed by construction activities. In the absence of mitigation, adverse effects of low spatial and medium-term temporal magnitude could occur on common herptile species.

2.198. The operational phase would, however, lead to reduced disturbance when compared with the baseline level. The proposed enhancements (see **Technical Appendix 2B**) would also lead to **significant gains** due to the creation of new species-rich grassland and scrub, new tree planting and herptile hibernacula, leading to increased prey abundance and shelter opportunities within the Application Site.

Birds

2.199. Main impacts on bird species from developments include:

- Direct loss or deterioration of habitats;
- Indirect habitat loss as a result of displacement by disturbance.

2.200. Breeding birds are highly susceptible to disturbance. The trees and hedgerows within the Application Site are likely to support a variety of common nesting birds during the breeding season, as are the adjacent woodland areas. This assemblage is likely also to include farmland birds of conservation concern. Buildings within and adjacent to the Application Site offer suitable opportunities for species such as the UK Priority species barn owl (also listed on Wildlife & Countryside Act 1981 (as amended) Schedule 1[39]).

2.201. The Proposed Development will not affect the buildings within the site. However, the construction phase may have a temporary adverse impact on breeding birds that use other habitats within and adjacent to the Application Site. This would result in an effect of low spatial and medium-term temporal magnitude. The effect may continue beyond a single bird generation, but is expected to be sufficiently small for the local population to recover relatively soon. This effect would not be significant for the commoner species, but could be significant for Priority species and birds of conservation concern.

2.202. The Proposed Development is to be constructed on land that is subject to a level of disturbance from current agricultural activities. However, in the absence of mitigation there is **potential for significant effects** on breeding birds if construction works are undertaken between the months of March and August inclusive.

2.203. Post construction, it is considered that the implementation of the EDS (**Technical Appendix 2B**) will increase the ecological value of the Application Site for birds. Disturbance during the operational phase is likely to be lower than the level currently experienced from crop treatments, and from noise and physical disturbance from agricultural machinery. Given this, **positive effects** are anticipated for these species during the operational phase.

Invertebrates

2.204. The vast majority of the Application Site (arable habitat / improved grassland) is considered to be of very limited value to invertebrates as it is relatively species-poor. However, the more diverse areas of grassland and field margins are likely to support a more diverse assemblage of common species.

2.205. Impacts on invertebrate species are likely to be limited to dust and other pollution emitted during the construction phase of the Proposed Development. The baseline assessed does, though, include periodic disturbance of a smaller but not incomparable magnitude from

[39] See https://www.legislation.gov.uk/ukpga/1981/69/schedule/1

agricultural activities several times a year. **No significant effect** is therefore anticipated during the construction phase.

2.206. Habitats will be significantly enhanced for invertebrates by new hedgerow, species-rich grassland, scrub and tree planting as part of the proposed EDS (**Technical Appendix 2B: Ecological Design Strategy**).

2.207. Overall, these species are deemed likely to experience significant **positive effects** in the absence of mitigation.

Mitigation and Enhancement Measures and Further Survey

Otter

2.208. There is potential for any otters using the site during the construction phase to become trapped in trenches excavated during works. In line with construction best practice, all excavations during the construction phase of the Proposed Development will be covered securely; this will therefore prevent the accidental trapping of otters.

2.209. Standard best practice measures in regard to pollution prevention (as identified above and in **Technical Appendix 8: Outline Construction Environmental Management Plan**) will be implemented to prevent contamination of the aquatic environment during the construction phase of the Proposed Development.

2.210. With the above in place, there will be **negligible effects** on otter from the Proposed Development.

Dormouse

2.211. In the unlikely event that any sign of dormice is found during works, construction should stop and an ecologist be contacted for advice (if not already present). Further mitigation for dormice will then involve Natural Recourses Wales licensing, restricted timings for vegetation clearance under supervision, and suitable native planting within the landscape design. A license must be gained before any further works with the potential to affect dormice can be undertaken.

2.212. As an enhancement, native species planting will include the favoured dormouse plants hazel and honeysuckle (see **Figure 1.23, Technical Appendix 1** and **Technical Appendix 2B: Ecological Design Strategy**). During the operational phase, the Application Site will also be subject to less disturbance due to the ceasing of the current agricultural activities. These factors will increase the potential of the site to support dormice.

2.213. With the above mitigation, the presence of the buffer zones designed into the project and the proposed habitat enhancements, dormouse is likely to experience minor **positive effects** overall.

Badger

2.214. It is recommended that a pre-construction badger survey is undertaken to assess the presence of badger immediately before construction. Any necessary mitigation will then be designed in accordance with relevant ecological guidance and legislative requirements.

2.215. The results of this survey will also be used to tailor the siting of the badger gates proposed within the development design. Individual gates may be installed more or less than 30m apart if the presence of mammal pathways observed during the survey indicates the presence of commuting routes that should be preserved.

2.216. During the construction process, all dug ground should be levelled and compacted wherever possible. All excavations are to be covered or closed off securely at the end of each working day to prevent the accidental trapping of badgers.

2.217. Enhancements designed into the Proposed Development (see **Technical Appendix 2B: Ecological Design Strategy**) include the following measure for badgers:

- Creation of new scrub and tree planting, providing new sett-building habitat;
- Fruit trees within this planting to provide additional badger foraging resources in autumn.

Bats

2.218. It is not proposed that any trees with bat roost potential ("BRP") will be removed at the Application Site. If any mature tree ultimately requires removal, it will need to be surveyed for BRP prior to removal. In line with Bat Conservation Trust guidelines[40], further surveys will be required should this BRP check determine the tree to be of medium or high bat roosting potential. Soft felling techniques will be used if low potential exists to ensure that no cavities are cut through, and branches or trunk pieces with cavities are lowered carefully to the ground and left with the access hole upward facing over night to allow any bats to leave.

2.219. The enhancements designed into the Proposed Development (see **Technical Appendix 2B: Ecological Design Strategy**) include the following measures for bats:

- Installation of bat boxes on retained trees of suitable size and location (including designs suitable for locally-present bat species identified by the desk study);
- Creation of new hedgerows, species-rich grassland, scrub and tree planting, providing new bat foraging opportunities;

[40] Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. Bat Conservation Trust, London.

- Measures to increase invertebrate numbers, increasing potential bat prey availability.

Other Mammals

2.220. No further survey is considered necessary in connection with other mammal species.

2.221. Although not relied on as mitigation, badger gates will be included within security boundary fencing. These will be positioned on average every 30m to allow the free movement of any small mammal in, out of and within the Application Site.

2.222. The enhancements designed into the Proposed Development (see **Technical Appendix 2B: Ecological Design Strategy**) include the following measures for hedgehog:

- Creation of new hedgerow, species-rich grassland and scrub habitat;
- Provision of hedgehog houses;
- Measures to increase invertebrate numbers, increasing potential hedgehog prey availability.

Herptiles

2.223. No further surveys are needed for herptile species. However, any strimming or other removal of vegetation during the herptile active season (March to September) should be carried out in phases, towards retained habitat. The initial phase should involve cutting the vegetation to a height of 150mm, followed by a second phase of cutting down to ground level if necessary. This method allows any reptiles or amphibians present to move out of the area ahead of works.

2.224. Where sections of hedgerow are to be removed, this should occur in suitable weather conditions, ideally using hand tools and during the herptile active season (see **Table 2-12**). If the work needs to occur between October and February, dismantling/removal will be overseen by a suitably qualified and experienced Ecological Clerk of Works ("ECoW").

2.225. Any amphibians or reptiles found should be moved carefully by an ecologist to suitable retained habitat in the vicinity or, if already present, to one of the herptile hibernacula to be created within the Application Site (see **Technical Appendix 2B: Ecological Design Strategy** and **Figure 1.23 of Volume 3, Technical Appendix 1**).

2.226. Enhancements designed into the Proposed Development include the following measures for herptiles:

- Creation of new hedgerow, species-rich grassland and scrub over existing arable habitat, providing new shelter and foraging resources,
- Creation of herptile hibernacula, and

- Measures to increase invertebrate numbers, increasing potential herptile prey availability.

Birds

2.227. Breeding birds are highly susceptible to disturbance. As the construction phase may have a significant impact on breeding birds within and adjacent to the Application Site, mitigation measures have been recommended to ensure that no significant impacts occur.

2.228. Where works are to commence during the breeding season (March to August inclusive), pre-commencement checks of possible nesting sites should be undertaken by a suitably experienced ecologist prior to works commencing. An appropriate buffer zone must be established around nesting birds until the young have fully fledged.

2.229. Proposed enhancements (see **Technical Appendix 2B: Ecological Design Strategy**) include the following measures for birds:

- Planting of new hedgerows, species-rich grassland, scrub and trees, providing new nesting and foraging resources,
- Measures to increase invertebrate numbers, increasing potential prey availability for insectivorous birds, and
- Erection of bird boxes, including a design suitable for the Devon Priority species house sparrow.

Invertebrates

2.230. No further survey or mitigation is considered necessary in connection with invertebrates.

2.231. The enhancements designed into the Proposed Development (see **Technical Appendix 2B: Ecological Design Strategy**) include the following measures benefitting invertebrates:

- Planting of new hedgerows, species-rich grassland, scrub and trees, increasing invertebrate habitat interest,
- Provision of invertebrate boxes/hotels,
- Creation of bee banks, and
- Creation of herptile hibernacula, doubling as a dead wood resource for saproxylic invertebrates.

Residual Effects

2.232. With the implementation of pre-commencement surveys and the proposed mitigation measures, it is considered that there will be **no significant negative effects** upon protected or notable species during the construction phase. The EDS and Green infrastructure Plan propose a number of habitat creation and enhancement measures centred around new hedgerows, species-rich grassland, tree and scrub planting, herptile hibernacula and bird and bat boxes. With the implementation of these, **the potential of the Application Site to support local wildlife will increase** and the Proposed Development will lead to a significant **positive effect** on a number of protected and Priority species during the operational phase.

2.233. Residual effects on otters are considered **negligible to minor positive**.

2.234. Residual effects upon dormice are envisaged to be **minor positive**.

2.235. Residual effects on badgers are considered to be **minor positive**.

2.236. Residual effects upon bats are envisaged to be **significant and positive**.

2.237. Residual effects on hedgehog and common small mammals are considered **significant and positive**.

2.238. Residual effects on other mammals including brown hares and harvest mice are **not considered to be significant.**

2.239. Residual effects upon herptiles are envisaged to be **significant and positive**.

2.240. Residual effects upon birds are considered to be **significant and positive**.

2.241. Residual effects upon invertebrates are considered to be **significant and positive**.

Ecosystem Services

In the Absence of Mitigation

2.242. Ecosystem services are likely to be degraded to a minor degree during the construction and decommissioning phases. The impacts on habitats and protected species above can broadly be taken as a proxy for impacts on various other ecosystem services (see **Table 2-10** below) that are also affected by noise, dust or disturbance to the ground and its vegetation cover.

2.243. The SPIES assessment predicts several changes to ecosystem services during the operational phase of the Proposed Development. These are listed in **Table 2-10** below.

Table 2-10: Impact on Ecosystem Services.

Degraded	Neutral	Enhanced
Biomass materials provision	Spiritual or religious enrichment	Air quality regulation
Educational / cultural interactions		Climate regulation
Food provision		Flood regulation
		Maintaining habitats and biodiversity
		Pest and disease regulation
		Pollination regulation
		Pollution regulation
		Recreation and aesthetic interactions
		Soil erosion regulation
		Soil quality regulation
		Water cycle support
		Water quality regulation

2.244. As can be seen from the above, the vast majority of these changes are beneficial. According to the SPIES tool, the positive impact on pollination services alone is likely to outweigh all the negative impacts. The operational phase will last for 40 years, while the construction and decommissioning phases are predicted to last circa six months each. **Significant positive effects** are therefore predicted in the absence of mitigation.

Residual Effects

2.245. The residual effects of Proposed Development on ecosystem services are predicted to be **significant and positive**. This means that the Proposed Development can be given consent in line with the Ecosystem Services duty established under Section 6 of the Environment (Wales) Act 2016, and paragraphs 3.8 and 6.4.5 of PPW 11.

CUMULATIVE EFFECTS

2.246. As well as singular effects, cumulative effects also need to be considered. The Conservation of Habitats and Species Regulations 2017 state that any plan or project that may, either alone or in combination with other plans or projects, significantly affect an international designated site should be the subject of an Appropriate Assessment.

2.247. Cumulative impacts can be an issue when the Proposed Development has a small impact on international sites or other sensitive ecological receptors. If other proposals also have a small impact, the combined result can have a significant impact on these features.

2.248. However, the Proposed Development will have **at worst a negligible effect** upon any individual receptor. For the purposes of this this assessment, it is therefore confirmed that **no likely significant cumulative effects** will occur upon any nearby environmental designated site, habitats or protected and Priority species.

CONCLUSION

2.249. To minimise potential impacts on local wildlife, protective ecological measures have been incorporated into the Proposed Development as part of the iterative design process. These include buffers from potentially sensitive ecological receptors (see **Table 2-11** below). Standard best practice pollution prevention measures for the construction stage have also been outlined and considered as part of the impact assessment, prior to mitigation. These measures are also outlined within **Table 2-12**.

2.250. A total of 14 habitat types were noted during the extended phase 1 habitat survey undertaken in June 2020. The main impacts during the construction phase include the direct loss of habitat under the Proposed Development footprint and indirect loss of habitat due to noise and vibration disturbance, and dust and water pollution. The **loss of these primarily improved grassland and arable habitat areas is considered to be of negligible significance** to nature conservation interest within the local area.

2.251. The desk-based assessment identified six Special Areas of Conservation ("SACs") and no Special Protection Areas ("SPAs") no possible SACs ("pSACs"), potential SPAs ("pSPAs") or Ramsar Sites within 15km. There are eight Sites of Special Scientific Interest ("SSSIs") and no National Nature Reserves ("NNRs") or Local Nature Reserves ("LNRs") within 5km of the Application Site. Three non-statutory designated environmental sites are present within 2km of the Application Site. Details of these designated sites have been provided and assessed above.

2.252. The only designated sites with connectivity to the Application Site are River Usk SAC, River Usk (Lower Usk) SSSI, River Usk (Upper Usk) SSSI. With the implementation of the recommended measures, it has been determined that there will be **no significant adverse effects** on any designated nature conservation site as a result of the Proposed Development.

2.253. Recommendations for further survey work have been provided within this report as part of the relevant mitigation measures. Please refer to **Table 2-12** below for these.

2.254. It is considered that the short-term disturbance resulting from the Proposed Development **will not be significant** if the recommended mitigation is undertaken. With the implementation of pre-commencement surveys and the proposed mitigation measures, it is considered that there will be **no significant negative effects** upon protected or notable species during the construction phase. The EDS and Green Infrastructure Plan propose a number of habitat creation and enhancement measures centred around new hedgerows, species-rich grassland, tree and scrub planting, log piles and bird, mammal and invertebrate houses/boxes. With the implementation of these, **the potential of the site to support local wildlife will increase** and the Proposed Development will lead to a **significant positive effect** on a number of protected or Priority species during the operational phase.

2.255. The Proposed Development **conserves and enhances** biodiversity and ecosystem services, minimising impacts, providing **net gains** and **strengthening existing and retained green**

infrastructure. This accords with national planning policy, including policies 9, 17 and 18 of Future Wales, paragraphs 3.8, 6.4.3 and 6.4.5 of Planning Policy Wales 11, and policies GI1, S13, EP3 and NE1 of the Monmouthshire Council Local Development Plan.

Table 2-11: Integral Design Measures and Standard Best Practice

Receptor	Potential Development Impacts	Phase of Development	Measures Implemented
INTEGRAL DESIGN MEASURES			
Aquatic environment, River Usk SAC, River Usk (Lower Usk) SSSI	Pollution	Construction	Avoidance of flood risk zone and all surface water areas including ponding
Habitats	Pollution and destruction	Construction	Avoidance of hedgerows, watercourses/field drains, woodland and trees
Otter, statutory designated sites	Disturbance of otter potentially associated with the River Usk (SAC/SSSI)	Construction	Avoidance of watercourses
Badger, hedgehog	Exclusion from foraging habitat	Operational	Security fencing to have badger gates to allow free movement of badger through the site
STANDARD BEST PRACTICE MEASURES			
Aquatic environment, River Usk SAC, River Usk (Lower Usk) SSSI	Pollution	Construction	Best practice pollution prevention measures implemented prior to and throughout the construction phase to prevent contaminants entering the aquatic environment
Badger, otter	Accidental trapping with excavations	Construction	All excavations should be securely covered at the end of each working day

Table 2-12: Recommended Mitigation Measures

Receptor	Potential Development Impacts	Phase of Development	Measures Implemented
MITIGATION MEASURES			
Dormouse	Disturbance, killing and injury, habitat disturbance/destruction and minor hedgerow loss	Construction	Implementation of non-licensed method statement Supervision of works to existing hedgerows by Ecological Clerk of Works
Badger	Destruction of badger setts	Pre-construction	Pre-commencement survey (Measures dependent on survey findings)
Bats	Habitat disturbance/destruction	Pre-construction	Bat Roost Potential survey of any tree to be removed (Measures dependent on survey findings)
Birds	Habitat disturbance/destruction of nesting habitat (Only if works are undertaken between March and August inclusive)	Pre-construction	Pre-construction nesting bird check (only if works are undertaken between March and August inclusive) (Measures dependent on survey findings)
Herptiles	Habitat disturbance/destruction and minor hedgerow loss	Construction	Any vegetation removal from March to September to be carried out directionally towards retained habitat, in two stages Careful removal of hedgerow performed with hand tools, only when air temperature is above 10°C, and not after long dry spells. Ecologist to be contacted if herptiles are found If the work needs to occur between October and February, dismantling/removal will be

			overseen by a suitably qualified and experienced Ecological Clerk of Works

APPENDICES

Appendix 2A – Figures

- Figure 2.1 – Statutory Environmental Designations
- Figure 2.2 – Non-Statutory Environmental Designations
- Figure 2.3 – Habitat Map

Appendix 2B – Photographs

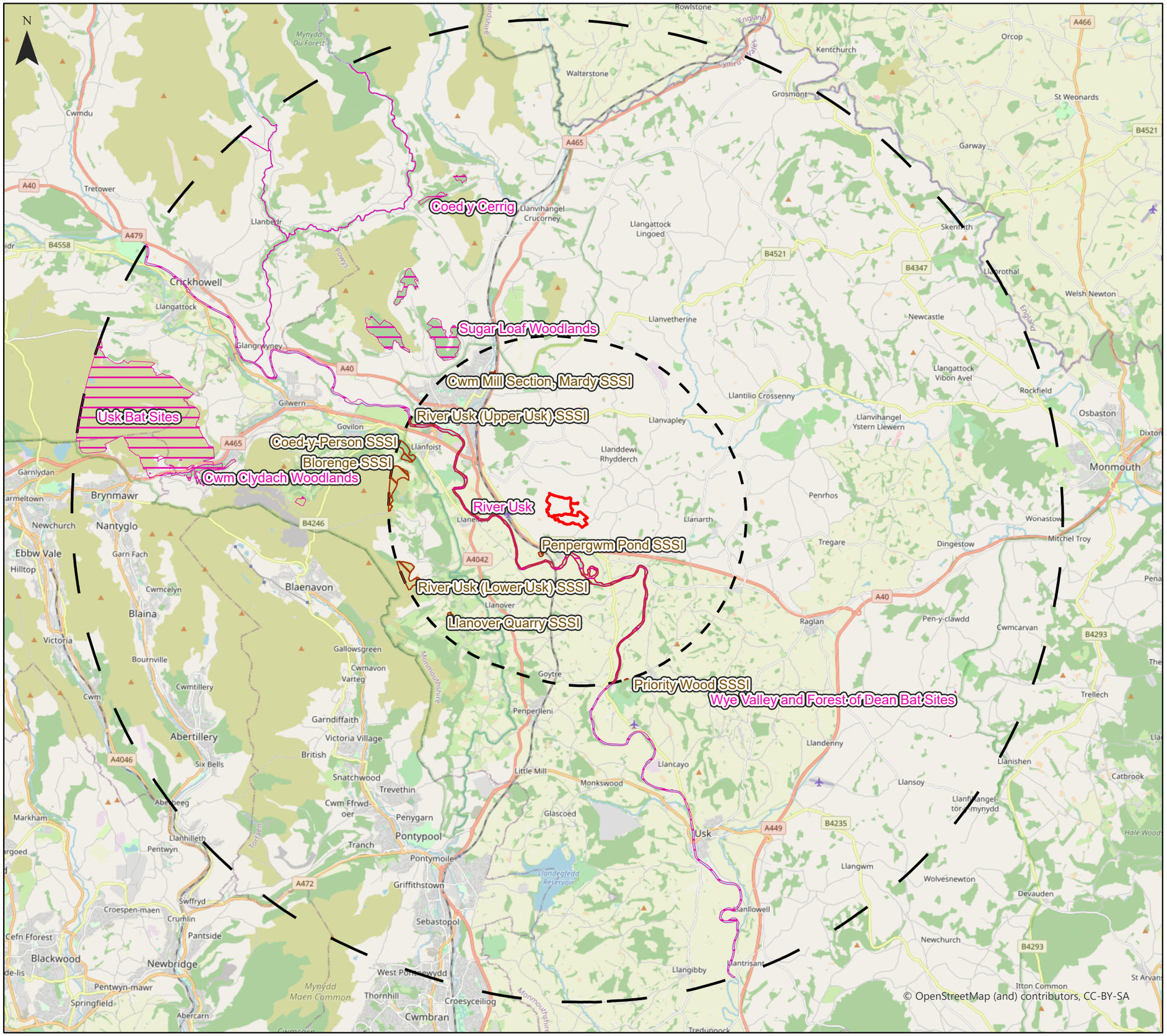
Appendix 2.1 – Bat Survey Report

Appendix 2.2 – Great Crested Newt Survey Report

Appendix 2.3 – Protected Species Survey Summary and Assessment

Appendix 2A: Figures

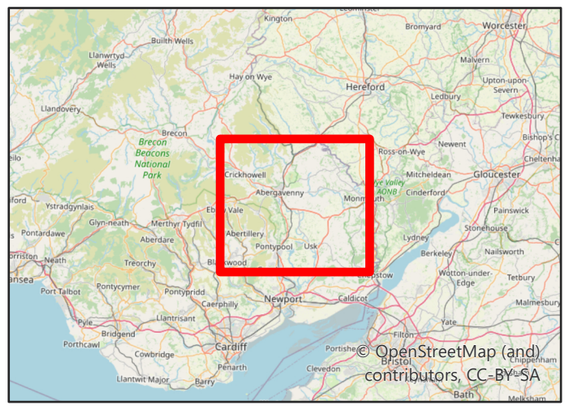
Penpergwm Solar Farm Environmental Designations Figure 2.1



Key

- Development Boundary
- 5km Study Area
- 15km Study Area
- Special Areas of Conservation (SACs)
- Sites of Special Scientific Interest (SSSI)

Neo Office Address:
Cinnamon House, Crab Lane, Warrington, WA2 0XP



Date: 31/03/2021
Drawn By: Daniel Flenley
Scale (A3): 1:120,000
Drawing No: NEO00668/001I/C

neo ENVIRONMENTAL

Penpergwm Solar Farm
Non-statutory Designations
Figure 2.2

Key

- Development Boundary
- 2km Study Area
- Site of Importance for Nature Conservation (SINC)

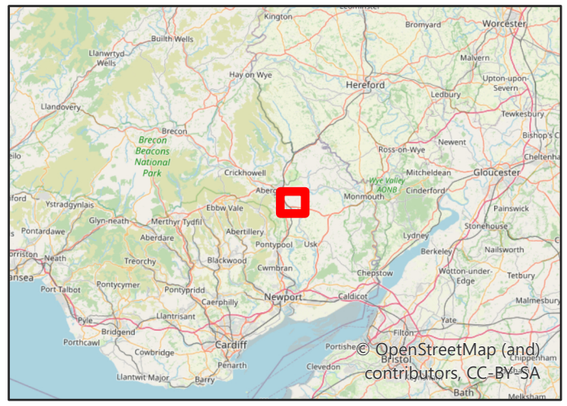
Cefynydd

Tyler's Wood

Bottom Farm

0 0.5 1 2 Kilometres

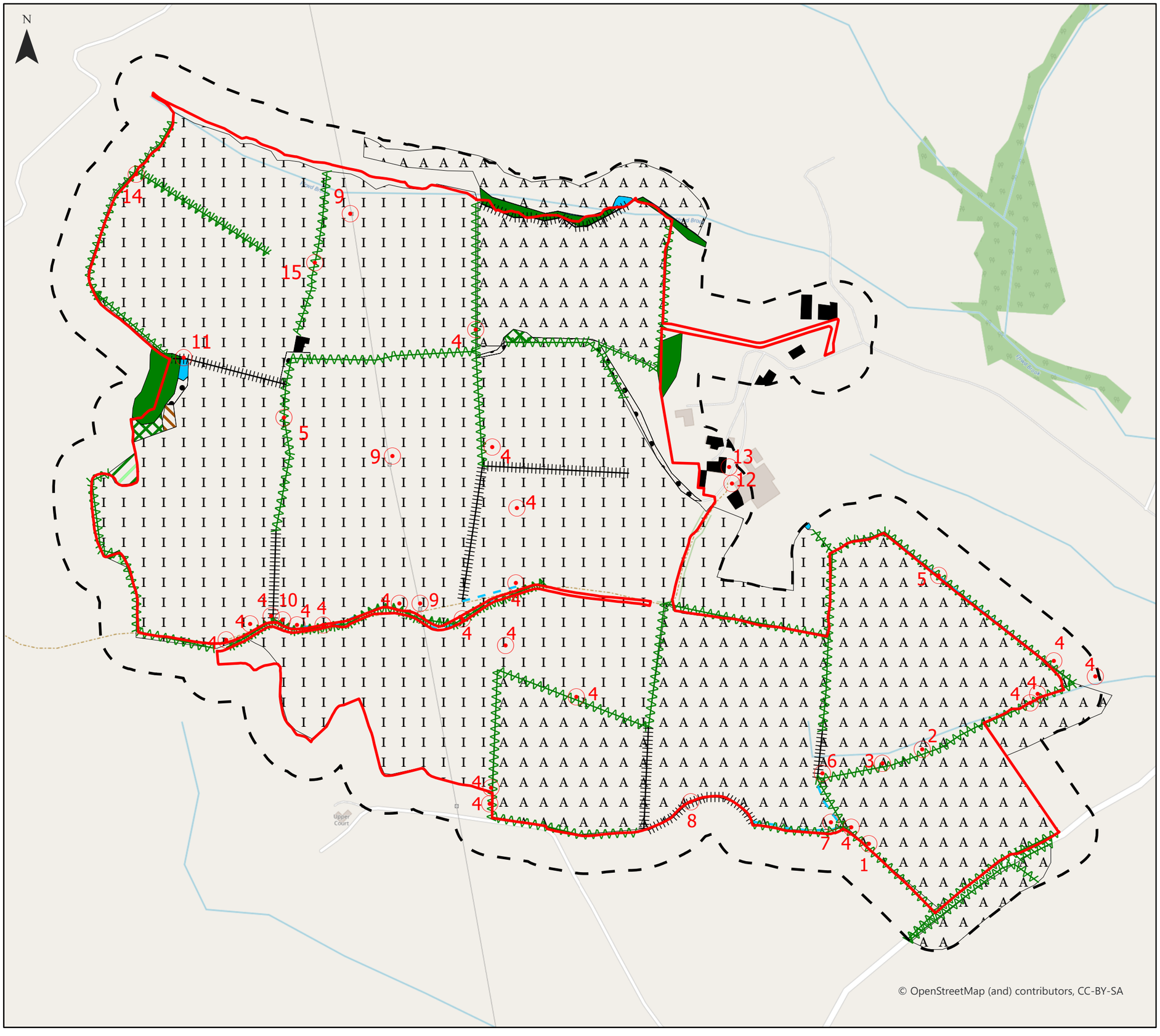
Neo Office Address:
Cinnamon House, Crab Lane, Warrington, WA2 0XP



Date: 31/03/2021
Drawn By: Daniel Flenley
Scale (A3): 1:20,000
Drawing No: NEO00668/019I/A

neo ENVIRONMENTAL

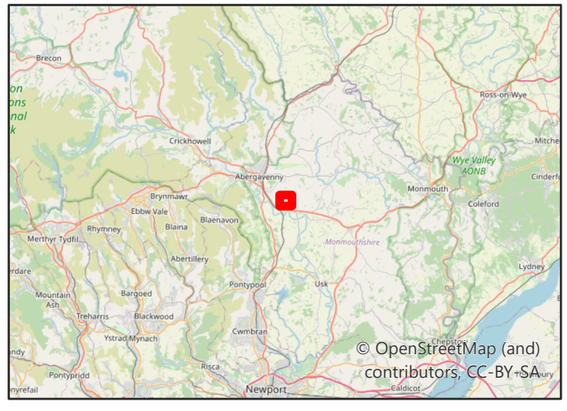
Penpergwm Solar Farm
Habitat Map
Figure 2.3



Key

- Development Boundary
- 50m Extended Survey Area (ESA)
- A.1.1 Broad-leaved Woodland, semi-natural
- A1.1 - Broad-leaved Woodland Plantation
- A2.1 - Scrub
- B4 - Improved Grassland
- C.3.1 - Tall Ruderal
- G.1 - Standing Water
- G.2 - Running Water
- J1.1 - Arable
- J.3.6 - Buildings
- J.4 - Bare Ground
- J2.1.1 - Intact Hedge (native species-rich)
- J2.3.1 - Hedgerows with Trees (native species rich)
- J2.4 - Fence
- J2.6 - Ditch
- Target Notes

Neo Office Address:
Cinnamon House, Crab Lane, Warrington WA2 0XP



Date: 15/06/2021
Drawn By: Daniel Flenley
Scale (A3): 1:5,000
Drawing No: NEO00667/0100I/B

neo ENVIRONMENTAL

Appendix 2B: Photographs

PHOTOGRAPHS

All field numbers noted in photographs refer to those illustrated on **Figure 3 of Volume 2: Planning Application Drawings**.

Photograph 1 Overview of site: Fields 2-4 from Field 5

Photograph 2 View of Field 1 from west

Photograph 3 View of Field 3 from north

Photograph 4 View of Field 4 from east

Photograph 5 View of Field 5 from west

Photograph 6 View of treeline within Field 7

Photograph 7: View of Field 8 from south

Photograph 8: View of Fields 9 and 10 from west

Photograph 9: View of Field 10 from north

Photograph 10: View of Field 11 from south

Photograph 11: View of Pond 9 in Field 5

Photograph 12: View of Pond 10 in Field 5

Photograph 13: Shallow Wet Ditch in Field 10

Appendix 2.1: Bat Survey Report

Penpergwm Solar Farm

22/06/2021

Disclaimer

Neo Environmental Limited shall have no liability for any loss, damage, injury, claim, expense, cost or other consequence arising as a result of use or reliance upon any information contained in or omitted from this document.

Copyright © 2021

Neo Environmental Ltd	
Head Office - Glasgow: Wright Business Centre, 1 Lonmay Road, Glasgow. G33 4EL T 0141 773 6262 E: info@neo-environmental.co.uk	
Warrington Office: Cinnamon House, Crab Lane, Warrington, WA2 0XP. T: 01925 661 716 E: info@neo-environmental.co.uk	**Rugby Office:** Valiant Suites, Lumonics House, Valley Drive, Swift Valley, Rugby, Warwickshire, CV21 1TQ. T: 01788 297012 E: info@neo-environmental.co.uk
Ireland Office: Johnstown Business Centre, Johnstown House, Naas, Co. Kildare. T: 00 353 (0)45 844250 E: info@neo-environmental.ie	**Northern Ireland Office:** Unit 3, the Courtyard Business Park, Galgorm Castle, Ballymena, Northern Ireland, BT42 1HL. T: 0282 565 04 13 E: info@neo-environmental.co.uk

Prepared For:

Great House Energy Centre Limited

Prepared By:

Daniel Flenley BSc (Hons) MPhil MCIEEM

Dara Dunlop BSc (Hons)

Natasha Wynne-Hughes MSc

	Name	Date
Edited By:	Dara Dunlop	22/06/2021
Checked By:	Daniel Flenley	22/06/2021
	Name	**Signature**
Approved By	Paul Neary	

Contents

1. Executive Summary 6
2. Introduction 7
Background 7
Development Description 7
Site Description 7
Scope of the Assessment 7
Statement of Authority 8
3. Policy and Guidance 10
4. Methodology 11
5. Results 15
6. Conclusions 24

STATEMENT OF PURPOSE

This draft Ecological Assessment is being published to accompany pre-application consultation carried out under Articles 8 and 9 of the Development of National Significance (Procedure) (Wales) Order 2016. The formal pre-application consultation runs until 25th August 2021. This report is to be read in conjunction with the accompanying reports and plans:

- *Volume 2: Planning Application Drawings*
- *Volume 3, Technical Appendix 1: Landscape and Visual Appraisal*
- *Volume 3, Technical Appendix 2A: Ecological Assessment*

EXECUTIVE SUMMARY

1.1. The contents of this report represent baseline survey results from the 2020 bat survey season, covering land 0.5km north of Penpergwm and circa 3.9km southeast of Abergavenny, Monmouthshire (the "Application Site").

1.2. The purpose of this report is to document the bat species present and the relevant levels of bat activity within the survey area associated with the Proposed Development. The information compiled in this report will be used to determine the importance of the survey area for bats and to identify key areas of bat activity.

1.3. Bat activity surveys were conducted by experienced field ecologists following Natural Resources Wales ("NRW") survey requirements and good practice guidelines set out by the Bat Conservation Trust ("BCT"). Further details are outlined in the Methodology section of this report.

1.4. Nine distinct bat species and groups were recorded within the survey area. These comprise common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared and Myotis bat species, lesser horseshoe, noctule, serotine and Leisler's bat. Activity hotspots include the southern boundary of Field 9, the cattle sheds north of Field 9 and the ponds on the site's western boundary.

1.5. Bat activity was highest during September. The year's mild autumn's conditions appear to have encouraged a prolonged burst of increased pre-hibernation feeding activity by certain bat species (most notably soprano pipistrelle).

1.6. In total 3,954 bat calls were recorded at the two static detector locations across all nights. The Application Site appears of relatively low value for most bat species. Some increased value is evident for common species (particularly common and soprano pipistrelle), and for Leisler's bat and Myotis species in early autumn.

1.7. As would be expected based on the habitats present, bat interest was noted mainly at the site boundaries. The impacts of the Proposed Development on bats are considered in Technical Appendix 2A: Ecological Assessment, to which this bat report forms an appendix.

INTRODUCTION

Background

1.8. Neo Environmental Ltd has been appointed by Great House Energy Centre Ltd (the "Applicant") to undertake bat surveys for a solar farm and associated infrastructure (the "Proposed Development") on land 0.5km north of Penpergwm and c. 3.9km southeast of Abergavenny, Monmouthshire (the "Application Site").

Development Description

1.9. The Proposed Development consists of the construction of a 40MW solar farm and will comprise PV panels mounted on metal frames, inverter and transformer units, new access tracks, underground cabling, perimeter fencing with CCTV cameras and access gates, a temporary construction compound and all ancillary grid infrastructure and associated works.

Site Description

1.10. The Application Site is located on land 0.5km north of Penpergwm and c. 3.9km southeast of Abergavenny, Monmouthshire; the approximate centre point of which is Grid Reference E332954, N211435. Comprising 14 agricultural fields, the Application Site measures 68.83 hectares (ha) in total. See Figure 1 of Volume 2: Planning Application Drawings for details.

1.11. Land within the Application Site itself is undulating, ranging between 61 – 140m Above Ordnance Datum (AOD) and consists of fields typically of medium scale, bound by a mixture of grassy field margins, semi-mature hedgerows, and intermittent trees (see Figure 3 of Volume 2: Planning Application Drawings for field numbers).

1.12. The Application Site is in an area with existing electricity infrastructure with a pylon line crossing Field 3 to the north and running in a north – south direction between Fields 6 and 7 and to the west of Field 8.

1.13. The local area is largely agricultural in nature, punctuated by individual properties and farmsteads; the nearest residential areas are the villages of Penpergwm and The Bryn; located 0.5km and 0.9km north respectively. Recreational Routes include two Public Rights of Way (PRoW) which pass through Fields 8, 9, 10 and 11 in the southern section of the site and an Other Route with Public Access (ORPA) which passes from Great House along the eastern boundary of Field 14 and through the treeline on the southern border of Fields 5, 6 and 7. Another PRoW passes along the northern boundary of Fields 1, 3 and 4.

1.14. While there are a number of drains and watercourses throughout the Application Site, including a small tributary of the Ffrwd Brook bordering Field 11, the site is entirely contained within Flood Zone A, an area described as having a "*Low probability*" of flooding.

1.15. The Application Site will be accessed via an improved farm access situated on the southern boundary. Traffic will approach the site entrance from the south using a local road from Penpergwm for approximately 800m. Traffic will be routed to Penpergwm from the north via the B4598. This road connects to the strategic road network south of Abergavenny at the A40 / A465 interchange.

Scope of the Assessment

1.16. The purpose was to obtain a baseline activity dataset for the Proposed Development. This was achieved by undertaking the following:

- A desk study;
- Field surveys to establish the presence of bats and to determine species;
- Identifying and characterising potential roosts and roosting features within the Survey Area.

1.17. Field surveys undertaken between August and October 2020 detailed in this report, comprise the following:

- Habitat risk assessments undertaken with reference to current guidance to give an indication of potential site risk based on the consideration of habitat and development-related features;
- Bat activity transect surveys undertaken with reference to current guidance to identify the bat species assemblage and relative distribution of bat activity within the survey area;
- Bat static automated surveys undertaken with reference to current guidance to supplement the transect surveys by providing data on temporal changes in bat activity.

Statement of Authority

1.18. The assessment has been managed by an ecologist registered with the Chartered Institute of Ecology and Environmental Management ("CIEEM"). All work has been carried out in line with the relevant professional guidance: CIEEM's Guidelines for Preliminary Ecological Appraisal and the Environment, Heritage and Local Government's Guidance on Appropriate Assessments.

1.19. Daniel Flenley has 14 years of ecology experience including undertaking surveys and writing associated reports. A full member of CIEEM, he has experience in undertaking and managing a range of surveys and assessments including Ecological Impacts Assessments ("EcIAs"), extended phase 1 habitat surveys and ornithological and protected species surveys, for over

400 projects. These include a variety of development types such as energy, commercial, industrial and transport infrastructure. Daniel holds a great crested newt class licence and has worked as an accredited agent under bat and amphibian mitigation and reptile survey licences.

1.20. Dara Dunlop is a Qualifying Member of CIEEM with circa 3 years' experience in the ecology sector, including working for an ecological consultancy, undertaking a range of protected species surveys and extended phase 1 habitat surveys for industrial schemes, and land management of designated sites. Dara has co-authored a number of reports including Ecological Impact Assessments and Protected Species Reports for various developments.

1.21. Natasha Wynne-Hughes is the founder of About the Wild Ecology, an ecological consultancy specialising in bats. Natasha is a licensed bat worker. After completing an MSc in Wildlife and Conservation Management, gathering survey experience with AVA Ecology Ltd and performing bat conservation research and fieldwork in her free time, she started her own firm in 2017. Natasha also works as a Biodiversity and Countryside Officer for Forest of Dean Council, and was previously employed as a Seasonal Ecologist by Mott MacDonald.

POLICY AND GUIDANCE

1.22. All species of bats and their breeding sites or resting places (roosts) are protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017[1] and Section 9 of the Wildlife and Countryside Act 1981 (as amended)[2].

1.23. It is an offence to:

- Deliberately to capture, injure or kill a bat.
- Intentionally or recklessly to disturb a bat in its roost or deliberately disturb a group of bats.
- To damage or destroy a bat roosting place (even if bats are not occupying the roost at the time).
- To possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat.
- Intentionally or recklessly to obstruct access to a bat roost.

1.24. Regulation 43 of the Conservation of Habitats and Species Regulations 2017 clarifies 'disturbance' of bats as any activity that will impair their ability:

- To survive, breed, or rear or nurture their young.
- In the case of animals of a hibernating or migratory species, to hibernate or migrate.
- To affect significantly the local distribution or abundance of the species to which they belong.

1.25. National planning policy, including Future Wales and Planning Policy Wales 11, is considered in relation to bats and other mammals in Technical Appendix 2A: Ecological Assessment.

Guidance Documents

1.26. Guidelines have been produced with regards to assessing the ecological impact of developments on bats in Wales and across the UK. Relevant guidance documents considered during this assessment therefore include the following sources, recommended by Natural Resources Wales ("NRW"):

[1] Parliament of the United Kingdom, 2017. The Conservation of Habitats and Species Regulations 2017. Available at: https://www.legislation.gov.uk/uksi/2017/1012/regulation/43/made

[2] Parliament of the United Kingdom, 1981. Wildlife and Countryside Act 1981 (as amended). Available at: http://www.legislation.gov.uk/ukpga/1981/69

- Bat Surveys for Professional Ecologists: Good Practice Guidelines [3]
- NRW Approach to Bats and Planning: GPG 3 [4]

METHODOLOGY

1.27. Bat activity surveys were conducted by experienced field ecologists following good practice guidelines as set out by the Bat Conservation Trust[5].

1.28. Three dusk transect surveys were carried out between August and October, and static detector monitoring was also carried out in September and October.

1.29. The survey area was determined by predicting impacts within and beyond the boundaries of the Proposed Development. Transect routes were designed to achieve the greatest coverage of habitats and features within the survey site, focusing on habitats or site features which were identified as having moderate or high suitability for bats, such as hedgerows and treelines.

Desk Study

1.30. A desk-based assessment was undertaken to collate available information on bats and to provide an indication of species likely to be present within the surrounding area.

1.31. A data search was conducted though the South East Wales Biodiversity Records Centre ("SEWBReC") to obtain information regarding protected/priority species within 2km of the Application Site boundary. The Application Site is centred on grid reference SO33351117, and records were requested from within 3km of the central grid reference due to the extent of the site.

Dusk Transect Survey

1.32. Appropriate transect routes of the survey area were determined by Daniel Flenley BSc (Hons) MPhil Grad CIEEM, an experienced ecologist, prior to the first transect. Transects were walked by an experienced surveyor on 31st August (Daniel Flenley), 22nd September and 27th October 2020 (Natasha Wynne-Hughes), using a constant walking speed with occasional pauses where heightened bat activity was recorded. Please see **Figure 2.1.1** for the transect route.

[3] Bat Conservation Trust (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, 3rd Edition. Available at: https://www.bats.org.uk/

[4] Available at: https://cdn.cyfoethnaturiol.cymru/media/681115/gpg-3-nrw-approach-to-bats-and-planning-english.pdf?mode=pad&rnd=131909171450000000

[5] Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition

1.33. A bat pass is defined by the Bat Conservation Trust as a sequence of greater than two echolocation calls made as a single bat flies past the microphone. A bat pass is an index of bat activity rather than a measure of number of individuals in a population.

1.34. Bat passes were recorded using an Echo Meter Touch 2 Pro handheld detector allowing for later sound analysis of calls were necessary. Where possible, bats within the survey area were identified to their species level. As well as the audible recording of bats within the area, any visual records during the transect surveys were mapped and the activity of bats (commuting, foraging, etc.) noted.

1.35. As set out in current guidance[6], transect surveys begin 30 minutes before sunset and continue for 2 hours 30 minutes or until conditions deteriorate[7]. Surveys for this Application Site were carried out during suitable weather conditions to avoid any adverse conditions causing bias within the survey results. Each survey outlined within this report therefore continued for the full 2 hours 30 minutes after sunset.

Static Activity Survey

1.36. The survey area was assessed over a minimum of five consecutive nights during September and October 2020, resulting in a total data collection of 11 nights during the season. Static data collection commenced later than transect surveys owing to the survey work being commissioned at short notice, not allowing sufficient time to ensure static detector availability in August.

1.37. Two automated remote bat detectors (Wildlife Acoustics Song Meter SM4 BAT FS bat detectors, full spectrum and zero crossing with SMM-U2 microphone, or SM2B detectors with SMX-U1 microphone) were deployed on site. These were programmed to record bat passes within the survey area from 30 minutes before sunset to 15 minutes before sunrise each night.

1.38. One remote ("static") detector was placed along the treeline south of Field 1 in the west of the Application Site, while the other was placed on the southern boundary hedgerow of Field 9. Figure 2.1.1 shows these static detector locations. The locations were chosen as they represented areas of increased bat activity (Field 9) or activity by potentially uncommon species (Field 1) as noted on the first transect visit, close to mature trees with potential roosting features on opposite sides of the site. This increased the spatial spread of the coverage and the likelihood of detecting a bat roost.

1.39. Temperatures on all nights recorded were suitable for bat foraging. Three nights (2nd to 4th October) were somewhat breezy, with reduced bat activity clearly seen on the 3rd and 4th

[6] Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition

[7] Conditions were deemed as unsuitable for survey work to continue when weather conditions deteriorated i.e. temperatures dropped below 7°C or when weather conditions were no longer suitable as stated in Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, 2016).

October when compared with previous nights. Nonetheless, bat activity was recorded on each of the 11 static survey nights. Further details are given below.

Data Analysis

1.40. Transect data was analysed with Echo Meter and Kaleidoscope Pro software using a combination of manual and automated identification. Static detector calls were analysed using Kaleidoscope Pro software using a combination of manual and automated identification. A sample of 134 files assigned various automatic identifications by Kaleidoscope Pro was verified manually to test the software's accuracy on the dataset. The software identified 75.8% of files correctly, with 11.9% false negatives (i.e. missing a bat pass), 6.0% of passes assigned to the wrong species or group, 5.2% identifying the correct species but missing a second species within the file, and 3.0% false positives (all identifying noise files as Leisler's bat passes). Further manual identification was therefore undertaken to increase accuracy.

1.41. At present there is no nationally accepted standard system to categorise bat activity as low, moderate or high, because activity levels vary depending on the species involved and the location of a site. However, the online tool *Ecobat*[8] is becoming frequently used to benchmark nightly activity levels based on other data collected in the region in question. The survey results were analysed against an Ecobat reference range dataset stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100km^2 of the survey location.
- Records using any make of bat detector.

Limitations

1.42. The following limitations and constraints were identified:

- Observations of bats during transect surveys can be restricted by low light levels. This lack of visual or contextual information means that a minimum amount of information can be inferred from recordings. The number of actual passes by an individual bat may be under-represented.
- Detection range for microphones will vary depending on weather conditions, surrounding clutter and source volume/directionality[9]. It is likely that bat passes will be recorded outside the survey area, given the range of the microphones. However, it is also possible bats flying at height or facing away from the microphone will not be

[8] Available at: http://www.mammal.org.uk/science-research/ecostat/

[9] Wildlife Acoustics (2017) *Detecting Bats with Ultrasonic Microphones*, Available at: https://www.wildlifeacoustics.com

detected. Detection variance was minimised where possible by positioning microphones away from clutter.

- Data from static detectors is limited because of the lack of observational context. This lack of visual or contextual information means that the minimum amount of information can be inferred from recordings. Number of actual bat passes by an individual bat may be under-represented. Given the proximity of the static detectors it is likely that bat passes were recorded by both detectors given the range of the microphones.
- Identification of bats to the species level is only possible where parameters allow a high degree of confidence in the assigned species. As a result, some recordings have been identified to genus level only.
- As it was impractical to verify every single sound file manually, some of the biases inherent within the automatic ID function is likely to remain. This means that the total number of bats may be slightly underestimated, but the abundance of rarer species including horseshoe and long-eared bats is likely to be overestimated by up to 40%.
- Sunset and sunrise times varied over the course of the survey period. This can affect bat activity on an individual night, which should therefore be borne in mind.
- Ecobat analysis may slightly underestimate the relative activity levels of the site in mid- to late autumn. This is because few surveys are likely to be performed later than those carried out at the Application Site, meaning the final static detector survey period may be being compared largely against datasets from earlier in the month when bats are usually more active. Nonetheless, the end of October 2020 was relatively warm in this part of South Wales, so the effect of any underestimation is likely to be low.
- Due to problems extracting the spatial reference dataset from the sound files recorded, no map is available for the September transect. However, spatial patterns have been gleaned from the results of the other surveys performed to inform the value of different areas of the site in so far as possible.

RESULTS

Desk Study

1.43. The potential presence of bats within the study area was assessed though a data search. This identified records of bats within 3km of the Proposed Development.

1.44. **Table 5-1** below summarises the species of bat recorded within the search area, and their potential to be present within the survey area.

Table 5-1: Summary of biological records

Species	Suitable Habitat or Field Signs Observed within Survey Area	Potential for Species within Survey Area
Leisler's Bat (*Nyctalus leisleri*)	Yes	Yes
Common Pipistrelle *(Pipistrellus pipistrellus)*	Yes	Yes
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	Yes	Yes
Whiskered Bat (*Myotis mystacinus*)	Yes	Yes
Daubenton's Bat (*Myotis daubentonii*)	Yes	Yes
Natterer's Bat (*Myotis nattereri*)	Yes	Yes
Noctule (*Nyctalus noctula*)	Yes	Yes
Brown Long-eared Bat (*Plecotus auritus*)	Yes	Yes
Greater Horseshoe Bat (*Rhinolophus ferrumequinum*)	Yes	Yes
Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	Yes	Yes

Myotis Bat species (*Myotis* sp.)	Yes	Yes
Pipistrelle Bat species (*Pipistrellus* sp.)	Yes	Yes

Transect Survey Results

1.45. A total of three dusk transect surveys were undertaken at the site between August and October 2020. Please see **Table 5-2** for survey start and finish times, and weather conditions. **Table 5-3** summarises the survey results.

Table 5-2: Start and Finish Times and Weather Conditions During Transect Surveys

Date	Start Time	Finish Time	Temperature (°C)	Cloud Cover (%)	Wind Speed (mph)
31/08/2020	19.30	22.30	13-17	20-30	0-5
22/09/2020	18.41	21.41	15-16	60-100	6-8
27/10/2020	16.25	18.55	12-13	60-100	5-10

Table 5-3: Bat Passes Recorded During Transect Surveys

Species	August	September	October
Common Pipistrelle *(Pipistrellus pipistrellus)*	22	28	0
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	13	37	6
Myotis sp.	13	15	0
Long-eared bat (*Plecotus* sp.)	2	7	0
Noctule (*Nyctalus noctula*)	5	7	0

Leisler's Bat (*Nyctalus leisleri*)	0	3	0
Unidentified *Nyctalus* sp.	1	0	0
Other Unidentified Bat	1	0	0
Total Passes	**57**	**97**	**6**

1.46. During the three transect surveys, six distinct bat species/groups were recorded. The single unidentified *Nyctalus* sp. recording represents either a noctule or a Leisler's bat, so does not count as an additional species group. 'Other unidentified bat' is also considered likely to belong to one of the identified groups.

August

1.47. Bats of five distinct groups or species were recorded sporadically along the transect, as shown on **Figure 2.1.2**. Particular hotspots included the southern boundary of Field 9, the cattle sheds north of Field 9 and the ponds on the site's western boundary. Up to three *Myotis* sp. bats were recorded foraging together near these ponds.

1.48. The first bat, a soprano pipistrelle, was recorded at 20.27, some 27 minutes after sunset, on the southern boundary of Field 10. A single pass was recorded, with the species then seen foraging in the south of Field 9 a few minutes later. This suggests that the species is roosting nearby.

September

1.49. Activity during the September survey was higher than in August, a pattern which was noted on several of Neo Environmental's UK survey sites in 2020. The number of registrations increased for all species recorded in August, with a sixth (Leisler's bat) also recorded at one point. This suggests that the autumn's mild conditions encouraged a prolonged burst of increased pre-hibernation feeding activity by a number of bat species.

1.50. The first individual recorded, a Leisler's bat, was noted at 19.14, three minutes after sunset. This suggests that the species is roosting near the site. Leisler's bats typically roost in old buildings and trees, so this may indicate roosting in a nearby barn or a tree in one of the offsite woodlands.

1.51. Due to problems extracting the spatial reference dataset from the sound files recorded, no map is available for the September transect.

October

1.52. Only six bat calls were recorded during the autumn transect survey. These all represented likely foraging activity by soprano pipistrelle between 18.24 and 18.27. The paucity of bat records on this survey is likely due in part to the lateness of the season, although static detector results (see below) show that some bat activity continued right until the end of the month.

1.53. The calls on the transect were all recorded offsite, northwest of Field 10 (see **Figure 2.1.3**). The earliest call was detected 31 minutes after sunset. This concords with the August results, suggesting that a roost is present relatively close to the Application Site.

Static Survey Results

1.54. Static bat detectors recorded for a total of eleven nights during the autumn bat season. **Table 5-4** presents these dates as well as the temperature and wind speed recorded each night.

Table 5-4: Static Survey Nights, Temperatures and Wind Speeds Recorded

Date	Temperature (°C)	Wind Speed (mph)
28/09/2020	11-16	3-13
29/09/2020	11-13	5-10
30/09/2020	7-14	3-10
01/10/2020	10	10-20
02/10/2020	12-13	15-20
03/10/2020	9-11	10-23
27/10/2020	9-16	5-18
28/10/2020	9-13	9-20
29/10/2020	16	9-16
30/10/2020	15-16	5-20
31/10/2020	11-12	9-20

1.55. **Tables 5-5** to **5-6** outline the total number of passes by each species each night.

Table 5-5: Total Bat Passes South of Field 1. CPip: Common Pipistrelle, SPip: Soprano Pipistrelle, NPip: Nathusius' Pipistrelle, LE: Long-eared Bat sp.

Date	CPip	SPip	NPip	LE	*Myotis* sp.	Lesser Horse-shoe	Serotine	Leisler's Bat	Noctule	*Nyctalus / Eptesicus* sp.[10]
28/09/2020	650	142	1	0	5	1	15	4	23	1
29/09/2020	113	115	0	0	8	0	4	1	5	0
30/09/2020	16	78	0	0	7	0	27	3	9	0
01/10/2020	33	7	0	0	3	1	5	3	15	0
02/10/2020	3	8	0	0	1	0	0	0	0	0
03/10/2020	0	4	0	0	0	0	0	0	0	0
27/10/2020	0	1	0	1	0	0	0	0	0	0
28/10/2020	1	2	0	2	0	0	0	0	0	0
29/10/2020	0	0	0	0	0	0	0	0	0	0
30/10/2020	8	23	0	26	2	0	0	18	21	18
31/10/2020	0	1	0	1	2	0	0	0	0	0
Total	**824**	**381**	**1**	**30**	**28**	**2**	**51**	**29**	**73**	**19**

[10] *Nyctalus / Eptesicus sp.*: represents an unidentified noctule or Leisler's Bat call, not a separate species / species group

Table 5-6: Total Bat Passes, Field 9. CPip: Common Pipistrelle, SPip: Soprano Pipistrelle, LE: Long-eared Bat sp.

Date	CPip	SPip	LE	*Myotis* sp.	Lesser Horse-shoe	Noctule	Serotine	*Nyctalus / Eptesicus* sp.	Leisler's Bat
28/09/2020	64	263	4	45	1	2	3	0	0
29/09/2020	85	464	1	48	0	0	0	0	0
30/09/2020	17	108	1	22	0	0	0	0	0
01/10/2020	3	51	0	14	2	1	0	0	0
02/10/2020	3	27	0	19	0	0	0	1	0
03/10/2020	0	1	0	0	0	0	0	0	0
27/10/2020	1	63	0	1	0	0	0	0	0
28/10/2020	1	172	0	1	0	0	0	0	0
29/10/2020	19	267	0	1	0	0	0	0	0
30/10/2020	37	561	0	0	0	3	0	0	3
31/10/2020	0	135	0	1	0	0	0	0	0
Total	**230**	**2112**	**6**	**152**	**3**	**6**	**3**	**1**	**3**

1.56. Table 5-7 below summarises all bat activity per static detector per night.

Table 5-7: Total Bat Passes Recorded Nightly at Each Location

Date	Location		
	South of Field 1	Field 9	Total
28/09/2020	842	382	**1224**
29/09/2020	246	598	**844**
30/09/2020	140	148	**288**
01/10/2020	67	71	**138**
02/10/2020	12	50	**62**
03/10/2020	4	1	**5**
27/10/2020	2	65	**67**

28/10/2020	5	174	**179**
29/10/2020	0	287	**287**
30/10/2020	116	604	**720**
31/10/2020	4	136	**140**
Grand Totals	1438	2516	**3954**

Early Autumn

1.57. A total of nine species/groups (common, soprano and Nathusius' pipistrelle, long-eared and *Myotis* bat species, lesser horseshoe, noctule, serotine and Leisler's bat) were recorded across the site during remote detection. Common and soprano pipistrelle were by far the most abundant of these. Common pipistrelle accounted for the majority of bat activity adjacent to Field 1 and Soprano Pipistrelle accounted for over 73% of passes adjacent to Field 9.

Mid/Late Autumn

1.58. A total of seven species/groups (common and soprano pipistrelle, long-eared and *Myotis* bat species, noctule and Leisler's bat) were recorded across the site during remote detection. This again consisted primarily of activity by the commonest species (common and soprano pipistrelle), with more limited records of both larger and scarcer bat species.

1.59. When compared with early autumn, bat activity was drastically reduced adjacent to Field 1 but stayed relatively consistent by Field 9. The reduction in overall bat diversity and activity fit the expected pattern for this time of year. Bats in the UK typically begin periods of torpor in October ahead of their overwinter hibernation, and are therefore becoming less active. They also begin searching for hibernation sites, leading to changes in their distribution patterns. Notably, soprano pipistrelles now accounted for almost 95% of activity by Field 9. This indicates that this species probably spent less time in torpor than the other bat species and/or was still primarily focused on feeding rather than hibernation site selection.

1.60. Long-eared bat activity increased adjacent to Field 1 during this period, due largely to a single night (30th October 2020) on which 26 passes were registered. The cause of this is difficult to assess given the relatively low overall number of long-eared bat passes. As no clearer or more prolonged pattern exists, this finding may simply be down to chance. However, it could also indicate long-eared bat movement across the Application Site between foraging areas and offsite hibernation locations.

Relative Site Value

1.61. Table 5-8 presents the number of nights in each Ecobat activity level class per location.

Table 5-8: Ecobat Activity Level Results

Location	Species / Group	Activity Level				
		High	Moderate to High	Moderate	Low to Moderate	Low
South of Field 1	Serotine	0	2	2	0	7
	Myotis sp.	0	0	3	3	5
	Eptesicus/ Nyctalus sp.	2	1	0	0	8
	Nyctalus sp.	1	0	0	0	10
	Leisler's Bat	0	1	1	2	7
	Noctule	0	4	1	0	6
	Nathusius' Pipistrelle	0	0	0	0	11
	Common Pipistrelle	3	1	1	1	5
	Soprano Pipistrelle	3	1	3	1	3
	Long-eared Bat sp.	0	1	0	1	9
	Lesser Horseshoe	0	0	0	0	11
Field 9	Serotine	0	0	0	1	10
	Myotis sp.	2	3	0	0	6
	Leisler's Bat	0	0	0	1	10
	Noctule	0	0	0	2	9
	Common Pipistrelle	3	2	0	2	4
	Soprano Pipistrelle	8	1	0	0	2
	Long-eared Bat sp.	0	0	1	0	10
	Lesser Horseshoe	0	0	0	1	10

1.62. This shows that the modal class for almost all species at both locations is 'low.' In other words, these bats were mostly recorded at low activity levels relative to nearby survey sites at this time of year. The exception to this pattern is soprano pipistrelle, which averages moderate activity levels south of Field 1 and high activity levels along the boundary of Field 9.

1.63. Of the scarcest species recorded, two (Nathusius' pipistrelle and lesser horseshoe) were always recorded at low to low/moderate activity levels. The third of these scarce species, Leisler's bat, while mostly recorded at these levels, was heard at moderate and moderate/high levels on 28th September and 30th October 2020. This occurred only along the treeline south of Field 1.

1.64. Bats with the highest relative activity within the Application Site mostly belong to the commonest UK species. However, one less common group (*Myotis* bats) also occurred at moderate/high to high levels on the southern boundary of Field 9 in the early autumn.

1.65. Static survey results therefore show that the Application Site is of relatively low value for most bat species.

CONCLUSIONS

1.67. Nine distinct bat species and groups were recorded within the survey area. These comprise common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared and *Myotis* bat species, lesser horseshoe, noctule, serotine and Leisler's bat.

1.68. In total 3,954 bat calls were recorded at the two static detector locations across all nights. The Application Site appears of relatively low value for most bat species. Some increased value is evident for common species (particularly common and soprano pipistrelle), and for Leisler's bat and *Myotis* species in early autumn.

1.69. Six of the nine species/groups were recorded during the activity transect surveys performed in August, September and October 2020. Hotspots included the southern boundary of Field 9, the cattle sheds north of Field 9 and the ponds on the site's western boundary. Up to three Myotis sp. bats were recorded foraging together near these ponds. Bat activity was highest during September. The year's mild autumn's conditions appear to have encouraged a prolonged burst of increased pre-hibernation feeding activity by certain bat species (most notably soprano pipistrelle).

1.70. As would be expected based on the habitats present, bat interest was noted mainly at the site boundaries. The impacts of the Proposed Development on bats are considered in Technical Appendix 2A: Ecological Assessment, to which this bat report forms an appendix.

APPENDICES

Appendix 2.1A – Figures

- Figure 2.1.1 – Bat Survey Map
- Figure 2.1.2 – August Transect
- Figure 2.1.3 – October Transect

Appendix 2.1A: Figures

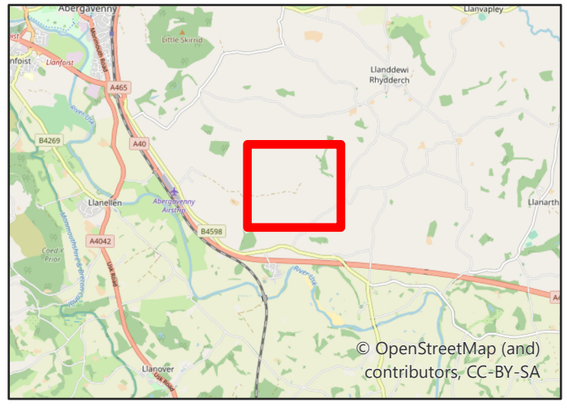
Penpergwm Solar Farm
Bat Survey Map
Figure 2.1.1

Key

- Development Boundary
- Ownership Boundary
- Static Detector
- Transect Route

0 0.25 0.5 1 Kilometer

Neo Office Address:
Cinnamon House, Crab Lane, Warrington WA2 0XP



Date: 23/02/2021
Drawn By: Daniel Flenley
Scale (A3): 1:5,000
Drawing No: NEO00668/016I/A

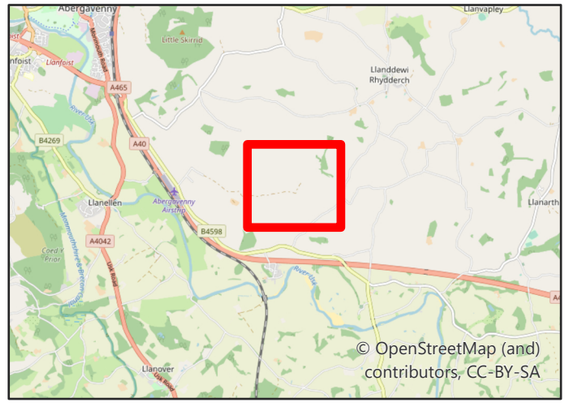
neo ENVIRONMENTAL

Penpergwm Solar Farm
August Transect Results
Figure 2.1.2

Key

- Development Boundary
- Transect Route
- Soprano Pipistrelle
- Common Pipistrelle
- Long-eared Bat sp.
- Myotis sp.
- Noctule
- Nyctalus sp.
- Unidentified Bat

Neo Office Address:
Cinnamon House, Crab Lane, Warrington WA2 0XP



Date: 24/02/2021
Drawn By: Daniel Flenley
Scale (A3): 1:5,000
Drawing No: NEO00668/017I/A

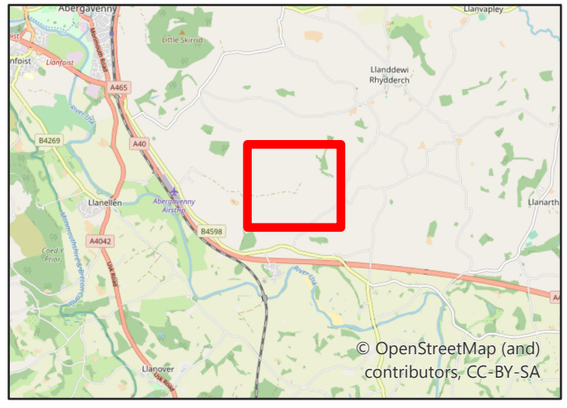
neo ENVIRONMENTAL

Penpergwm Solar Farm
October Transect Results
Figure 2.1.3

Key

- Development Boundary
- Transect Route
- Soprano Pipistrelle

Neo Office Address:
Cinnamon House, Crab Lane, Warrington WA2 0XP



Date: 19/04/2021
Drawn By: Dara Dunlop
Scale (A3): 1:5,000
Drawing No: NEO00668/017I/A

neo ENVIRONMENTAL

Appendix 2.2: Great Crested Newt Survey Report

Penpergwm Solar Farm

15/06/2021

Disclaimer

Neo Environmental Ltd shall have no liability for any loss, damage, injury, claim, expense, cost or other consequence arising as a result of use or reliance upon any information contained in or omitted from this document.

Neo Environmental Ltd	
Head Office - Glasgow: Wright Business Centre, 1 Lonmay Road, Glasgow. G33 4EL T 0141 773 6262 E: info@neo-environmental.co.uk	
Warrington Office: Cinnamon House, Crab Lane, Warrington, WA2 0XP. T: 01925 661 716 E: info@neo-environmental.co.uk	**Rugby Office:** Valiant Suites, Lumonics House, Valley Drive, Swift Valley, Rugby, Warwickshire, CV21 1TQ. T: 01788 297012 E: info@neo-environmental.co.uk
Ireland Office: Johnstown Business Centre, Johnstown House, Naas, Co. Kildare. T: 00 353 (0)45 844250 E: info@neo-environmental.ie	**Northern Ireland Office:** Unit 3, the Courtyard Business Park, Galgorm Castle, Ballymena, Northern Ireland, BT42 1HL. T: 0282 565 0413 E: info@neo-environmental.co.uk

Prepared For:

Great House Energy Centre Limited

Prepared By:

Daniel Flenley BSc (Hons) MPhil Grad CIEEM

	Name	Date
Edited By:	Dara Dunlop	15/06/2021
Checked By:	Nicole Beckett	15/06/2021
	Name	**Signature**
Approved By	Paul Neary	

Contents

Executive Summary 6
Introduction 7
Background 7
Development Description 7
Adopted Design Principles ..... Error! Bookmark not defined.
Site Description 7
Scope of the Assessment 7
Statement of Authority 8
Legislation and Policy 9
Wildlife and Nature Conservation Legislation 9
Planning Policies and Nature Conservation 9
Protection of Great Crested Newts in Wales 9
Guidance Documents 10
Methodology 11
Desk Study 11
Field Surveys 11
Survey Results 14
Impact Assessment 18
Conclusion 21
Appendices 22
Appendix 2.2A - Figures 23
Appendix 2.2B – HSI Assessment Results 24
Appendix 2.2C - Photographs 26

STATEMENT OF PURPOSE

This draft Ecological Assessment is being published to accompany pre-application consultation carried out under Articles 8 and 9 of the Development of National Significance (Procedure) (Wales) Order 2016. The formal pre-application consultation runs until XXX. This report is to be read in conjunction with the accompanying reports and plans:

- *Volume 2: Planning Application Drawings*
- *Volume 3, Technical Appendix 1: Landscape and Visual Appraisal*
- *Volume 3, Technical Appendix 2A: Ecological Assessment*
- *Volume 3, Technical Appendix 2B: Ecological Design Strategy ("EDS")*

EXECUTIVE SUMMARY

1.1. Neo Environmental Ltd has been appointed by Great House Energy Centre Limited to undertake great crested newt ("GCN") surveys for a proposed solar farm (the "Proposed Development") on land 0.5km north of Penpergwm and c. 3.9km southeast of Abergavenny, Monmouthshire (the "Application Site"). The aim of these was to determine the importance of the survey area for GCN and ascertain their presence or likely absence at the Application Site.

1.2. This was achieved by undertaking a desk study and field surveys to establish any GCN presence. Field surveys undertaken in May 2020 comprise Habitat Suitability Index (HSI) assessment of ten ponds and environmental DNA (eDNA) testing of one of these. Access to five other ponds within 500m was not granted. All surveys were conducted by an experienced field ecologist with a GCN survey licence. Methods followed the Amphibian and Reptile Groups of the United Kingdom's Advice Note 5 and the applicable Natural England standards.

1.3. No ponds will be lost during the Proposed Development. Optimal habitats for GCN will not be lost or fragmented by the construction of the proposed solar farm.

1.4. It is considered that GCN are likely to be absent from the Application Site. The surveys conducted in 2020 found one pond to be of limited GCN suitability. No adverse effects are predicted upon GCN as a result of the Proposed Development.

1.5. As a precautionary measure, works involving the removal of potential GCN sheltering/hibernation habitats should be carried out in suitable weather conditions using hand tools and, if possible, during the amphibian active season. If the work needs to occur between October and February, dismantling/removal will be overseen by a suitably qualified and experienced Ecological Clerk of Works ("ECoW").

1.6. In the very unlikely event that GCN are discovered during the course of construction, works in the area should stop immediately and an ecologist be contacted for advice.

1.7. With the implementation of an Ecological Design Strategy ("EDS") which is provided with the planning application, it is anticipated that there will be a net gain for biodiversity. The proposals will enhance habitats within the Application Site and create opportunities for amphibians including any GCN that colonise the Application Site in future.

INTRODUCTION

Background

1.8. Neo Environmental Ltd has been appointed by Great House Energy Centre Limited (the "Applicant") to undertake great crested newt (*Triturus cristatus*; "GCN") surveys for a proposed solar farm and associated infrastructure (the "Proposed Development") on land 0.5km north of Penpergwm and c. 3.9km southeast of Abergavenny, Monmouthshire (the "Application Site").

Development Description

1.9. The Proposed Development consists of the construction of a 40MW solar farm and will comprise PV panels mounted on metal frames, inverter and transformer units, new access tracks, underground cabling, perimeter fencing with CCTV cameras and access gates, a temporary construction compound and all ancillary grid infrastructure and associated works.

Site Description

1.10. The Application Site is located on land 0.5km north of Penpergwm and c. 3.9km southeast of Abergavenny, Monmouthshire; the approximate centre point of which is Grid Reference E332954, N211435. Comprising 14 agricultural fields, the Application Site measures 68.83 hectares (ha) in total. See **Figure 1 of Volume 2: Planning Application Drawings** for details.

1.11. Land within the Application Site itself is undulating, ranging between 61 – 140m Above Ordnance Datum (AOD) and consists of fields typically of medium scale, bound by a mixture of grassy field margins, semi-mature hedgerows, and intermittent trees (see **Figure 3 of Volume 2: Planning Application Drawings** for field numbers).

1.12. The Application Site is in an area with existing electricity infrastructure with a pylon line crossing Field 3 to the north and running in a north – south direction between Fields 6 and 7 and to the west of Field 8.

1.13. The local area is largely agricultural in nature, punctuated by individual properties and farmsteads; the nearest residential areas are the villages of Penpergwm and The Bryn; located 0.5km and 0.9km north respectively. Recreational Routes include two Public Rights of Way (PRoW) which pass through Fields 8, 9, 10 and 11 in the southern section of the site and an Other Route with Public Access (ORPA) which passes from Great House along the eastern boundary of Field 14 and through the treeline on the southern border of Fields 5, 6 and 7. Another PRoW passes along the northern boundary of Fields 1, 3 and 4.

1.14. While there are a number of drains and watercourses throughout the Application Site, including a small tributary of the Ffrwd Brook bordering Field 11, the site is entirely contained within Flood Zone A, an area described as having a "*Low probability*" of flooding.

1.15. The Application Site will be accessed via an improved farm access situated on the southern boundary. Traffic will approach the site entrance from the south using a local road from Penpergwm for approximately 800m. Traffic will be routed to Penpergwm from the north via the B4598. This road connects to the strategic road network south of Abergavenny at the A40 / A465 interchange.

Scope of the Assessment

1.16. The aim of the surveys was to determine the importance of the Survey Area for GCN and ascertain the presence or likely absence of GCN at the Proposed Development. This was achieved by undertaking the following:

- A desk study;
- Field surveys to establish any GCN presence.

1.17. Field surveys undertaken in May and June 2020 comprise the following:

- Habitat Suitability Index ("HSI") assessment of ten accessible ponds within 500m of the solar farm site to determine any need for further survey[1];
- Environmental DNA (eDNA) testing of one of these ponds to determine presence or likely absence of GCN.

1.18. This report presents the baseline survey findings from the 2020 survey season within the GCN Survey Area of the Proposed Development and provides subsequent recommendations.

Statement of Authority

1.19. The assessment has been carried out by an ecologist registered with the Chartered Institute of Ecology and Environmental Management (CIEEM). All work has been carried out in line with the relevant professional guidance, including CIEEM's Guidelines for Preliminary Ecological Appraisal[2] and Natural England's standing advice for GCN[3].

1.20. Daniel Flenley is an experienced ecologist with 14 years of experience in ecological surveys and over six years of experience writing assessments. A graduate member of CIEEM, he has recently applied for full membership. Daniel has experience in undertaking and managing a range of surveys and assessments including Ecological Impacts Assessments, extended phase 1 habitat surveys and ornithological, and protected species surveys, for over 350 projects. These include a variety of development types such as energy, commercial, residential and transport infrastructure. He is a Natural England licensed GCN surveyor.

[1] The development boundary has changed since the field surveys undertaken in May and June. The 500m Buffer around the original development boundary is shown in **Figure 2.2.1, Appendix 2.2A.**

[2] CIEEM (2017) Guidelines for Preliminary Ecological Appraisal. Second Edition.

[3] Natural England (2015) Great Crested Newts: Surveys and Mitigation for Development Projects

LEGISLATION AND POLICY

Planning Policies and Nature Conservation

1.21. Local Authorities have a requirement to consider biodiversity and geological conservation issues when determining planning applications under the following planning policies:

- Planning Policy Wales (Edition 11, February 2021)[4]
- Technical Advice Note 5 (2009)[5]

1.22. Planning policy for nature conservation in Wales is contained in the following document:

- Future Wales: The National Plan 2040[6]

Wildlife and Nature Conservation Legislation

1.23. Relevant policies which protect habitats and wildlife are implemented in Wales through the following legislation:

- The Wildlife and Countryside Act 1981 (as amended)[7]
- The Environment (Wales) Act 2016
- The Conservation of Habitats and Species Regulations 2017[8]
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017[9]

Protection of Great Crested Newts in Wales

1.24. Great crested newts are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017, making it an offence deliberately to disturb, injure or kill wild great crested newts. It is also an offence to damage, destroy or obstruct access to any Great Crested Newt breeding site or resting place.

1.25. Any activity or developments which may negatively affect the conservation status of great crested newts in Wales requires a derogation license. Licenses may be obtained via prior consent from Natural Resources Wales ("NRW") should no alternative action exist.

[4]Available at: https://gov.wales/planning-policy-wales
[5]Available at: https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf
[6] Available at https://gov.wales/future-wales-national-plan-2040
[7] Available at http://www.legislation.gov.uk/ukpga/1981/69/contents
[8] Available at http://www.legislation.gov.uk/uksi/2017/1012/contents/made
[9] Available at http://www.legislation.gov.uk/uksi/2017/571/contents/made

Guidance Documents

1.26. Guidance documents that have been considered during this assessment include:

- Great Crested Newt Conservation Handbook[10]
- Great Crested Newt Mitigation Guidelines[11]

[10] Langton, T.E.S., Beckett, C.L., & Foster, J.P. (2001) Great Crested Newt Conservation Handbook. Froglife, Halesworth.
[11] English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

METHODOLOGY

Desk Study

1.27. Records of GCN within 2km of the Application Site were obtained from the South East Wales Biodiversity Records Centre ("SEWBReC").

1.28. Ordnance Survey and aerial maps from MAGIC[12] were used to help identify ponds requiring further investigation.

Field Surveys

1.29. All GCN surveys were conducted by an experienced field ecologist with a GCN survey licence. The work was carried out by Daniel Flenley BSc (Hons) MPhil Grad CIEEM (Natural England Level 2 class licence 2015-16773-CLS-CLS). No tasks requiring a separate Welsh licence were carried out.

1.30. For ponds identified by the desk study but outside the Applicant's ownership, access was sought by telephone, email and/or letter ahead of surveys, allowing at least one full week for response. Additional ponds (ponds 12 to 15; see below) were discovered during surveys, and were assessed once permission was secured.

Habitat Suitability Index (HSI) Assessment

1.31. The Survey Area was visited on 1st May 2020 to conduct HSI assessment of onsite and accessible offsite ponds and wet ditches. Methods followed the Amphibian and Reptile Groups of the United Kingdom's Advice Note 5: Great Crested Newt Habitat Suitability Index, an adaptation of the original HSI[13], as used by Natural Resources Wales[14].

1.32. An extended Phase 1 habitat survey of the Application Site was undertaken on the 18th June 2020 by Alex Wilson BSc (Hons) PhD MCIEEM (see **Technical Appendix 2A: Ecological Assessment**). All but one of the ditches present within the Application Site were dry at the time, and assessed to be of limited interest for GCN. The single wet ditch had already been assessed during the May visit. HSI assessment was also performed for one additional pond discovered, using the same methodology as above.

1.33. This includes field assessment of several variables of the pond and surrounding terrestrial habitat, along with a desk-based assessment that covers other relevant factors relating to each pond.

[12] Available at https://magic.defra.gov.uk/

[13] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10(4), 143-155.

[14] Russell, L. *et al.* (2017) *Spatial Action Plan for Great Crested Newts in Anglesey: A Manual for Achieving Favourable Conservation Status.* NRW Science Report 76.

1.34. The variables are:

- Geographic location
- Pond area (size)
- Permanence
- Water quality
- Shade
- Waterfowl presence
- Fish presence
- Pond count within 1km
- Terrestrial habitat quality
- Macrophytes present.

1.35. The HSI is a numerical index between 0 and 1, wherein a score of 1 represents optimal habitat for GCN. Each of the above variables is assigned a numerical figure, and these are then used to calculate the tenth root of the product.

1.36. The calculated HSI score is used to define the habitat suitability of the pond on a categorical scale. It should however, be noted that the system is not precise enough to allow the conclusion that a pond with a high score will definitely support GCN whilst those with a low score will not.

1.37. A breakdown of HSI scoring can be seen in **Table 1** below.

Table 1 Relation between HSI and Pond Suitability

HSI Score	Pond Suitability for GCN
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

eDNA Survey

1.38. A shipment of GCN eDNA sampling kits was received from SureScreen Scientifics, Morley, Derbyshire on 24th April 2020. The single pond rated as having good suitability (pond 12; see **Appendix 2.2A, Figure 2.2.1**) was subjected to eDNA sampling by Daniel Flenley on 1st May 2020. Samples were stored below 5°C in a domestic refrigerated over the weekend, and

dispatched to SureScreen Scientifics on 4th May 2020. The samples entered processing on 5th May 2020. SureScreen laboratory analysis was conducted in line with the applicable Department for Environment, Food & Rural Affairs ("DEFRA") standards[15], and results were received on 7th May 2020.

1.39. Air temperature during sample collection was between 11°C and 13°C, with a north-westerly breeze and no precipitation, reducing the chance of splash contamination. There was no evidence of substantial rainfall having occurred the night prior to the survey.

Limitations

1.40. The data presented in this report reflects the status of ponds at the time of survey. GCN can disperse over large distances overland to colonise new aquatic and terrestrial habitats and therefore the colonisation of new areas is possible within a short timescale.

1.41. The development boundary changed since the GCN surveys were undertaken, however, the infrastructure boundary has not changed. In addition, this has not impacted the results, as all ponds within 250m of the final development boundary were surveyed (as outlined in Appendix 2.2A, Figure 2.2.1).

1.42. The recorded absence of GCN from a pond does not necessarily mean the pond is never used by the species. Therefore, negative results can only be treated as "likely absence".

1.43. Access to five of the ponds identified could not be obtained as the landowners did not reply to contact. These are listed below in Table 1-3.

1.44. One pond (pond 12; see below) was part of a flowing water system that was considered unsuitable for eDNA testing.

1.45. None of the survey constraints identified are considered to present significant limitations to interpreting the findings of the survey.

[15] Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014) Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

SURVEY RESULTS

Desk Study

1.46. The potential presence of GCN within the study area was assessed though a data search. This identified records of GCN within 2km of the Application Site.

1.47. Table 2 below summarises GCN records from within the search area. The closest and most recent record, approximately 0.6km northwest of the Application Site, dates from 2005. This is beyond the known dispersal distance of the species from breeding ponds (see below). However, it indicates the species has occupied the local area, albeit some time ago.

Table 2: Summary of GCN Records

TOTAL NUMBER OF RECORDS	GRID SQUARES WITH RECORDINGS OF SPECIES	DETAILS OF CLOSEST AND MOST RECENT RECORD
10	SO3212, SO3313, SO3412, SO3413	Present approximately 600m northwest of Application Site in 2005

1.48. Great crested newts are known to disperse up to 500m from breeding ponds, although this is only in exceptional cases where terrestrial habitat throughout the landscape is optimal. The 500m Buffer around the original Application Site Boundary, and the 250m buffer around the final Application Site Boundary is outlined in Appendix 2.2A, Figure 2.2.1.

1.49. All ponds surveyed are shown in Appendix 2.2A, Figure 2.2.1 and listed in Table 3 below.

Table 3: Ponds Within the Survey Area

POND ID	DISTANCE FROM BOUNDARY	DIRECTION	OBSERVATIONS
1	302m	North	Access not granted
2	205m	South	Scoped out by HSI
3	353m	South	Scoped out by HSI
4	On site boundary	Southwest	Access not granted
5	47m	North	Scoped out by HSI
6	164m	Southwest	Access not granted
7	198m	South	Access not granted
8	63m	South	Access not granted
9	Within site	n/a	Scoped out by HSI
10	On site boundary	West	Scoped out by HSI
11	422m	Southwest	Scoped out by HSI
12	313m	Northeast	No GCN eDNA detected
13	402m	Southwest	Scoped out by HSI

14a to 14d	57m to 65m	East	Scoped out by HSI
15	On site boundary	North	Assessed as average by HSI; limited suitability for eDNA testing due to water flow

Ditches

1.50. The Application Site also contains a series of wet and dry ditches. However, even the wettest ditches held only shallow water during the surveys; they were too shallow for eDNA testing, and are very likely to dry out each year. They are therefore considered unsuitable for breeding GCN.

Pond Descriptions

1.51. A brief description of the surveyed ponds can be found below, with photographs of each pond contained within Appendix 2.2C.

Pond 2

1.52. Pond 2 is a small woodland pond in full shade. The pond is set within an agricultural context, with approximately 20% duckweed cover and the occasional emergent herbaceous plant. Water is of poor quality, with high turbidity.

Pond 3

1.53. A broadly oval woodland pond, with steep sides that support holly and guelder rose scrub. Shaded by sweet chestnut and hazel trees. Poor water quality.

Pond 5

1.54. Pond 5 is a slurry store on the edge of a cattle paddock. It is partially shaded by a nearby tree and has grassy edges, but is almost devoid of aquatic vegetation. Highly polluted.

Pond 9

1.55. A woodland/pasture edge pond used by waterfowl and drinking livestock. The pond is shaded on the western side, and has a heavily poached eastern edge. Clumps of rushes are present along with infrequent emergent flowering plants. Moderate water quality.

Pond 10

1.56. Pond 10 is a small, shallow woodland edge pond with its field sides poached by livestock. Small semi-mature broadleaved trees grow within the pond, which had dried up by the time of the June visit. Poor water quality.

Pond 11

1.57. This shallow-edged garden pond, a little over 185m^2 in area, features extensive emergent plants including abundant water-crowfoot. Rushes fringe the pond in a few patchy locations. Moderate water quality.

Pond 12

1.58. Pond 12 is a fairly large, classic-style garden pond set into an amenity lawn. Rushes are abundant, water mint is occasional, and cuckoo-flower is found rarely among its fringing vegetation. Great bulrush and marsh marigold are present as emergents. The pond is shaded around approximately 25% of its edge by mature garden trees including a weeping willow, and has moderate water quality.

Pond 13

1.59. This garden pond, a short distance east of pond 11, is similar to it but considerably smaller and contains some water mint among a dense layer of emergent plants and covering vegetation. Moderate water quality, but already almost dry at the time of the first survey.

Ponds 14a to 14d

1.60. This is a cluster of four very small recently-created, manmade, artificially-lined garden ponds. The largest pond (14a) contained duckweed across just under 10% of the surface, plus an even more infrequent emergent grass species. Notwithstanding their recent construction, the creator and owner reported that smooth newts (*Lissotriton vulgaris)* had already colonised at least one pond. However, they are

Pond 15

1.61. A stream-fed pond on the northern boundary of Field 4 (see **Appendix 2.2A, Figure 2.2.1**). Set within stream corridor vegetation and largely surrounded by scrub, pond 15 also has a barer, more open section adjoining Field 4. Well-shaded, with some aquatic macrophytes present; water quality appears to be good.

HSI Assessment

1.62. During the GCN survey visits, ten ponds were assessed for their suitability to support GCN. A summary of findings can be found within **Table 4** below, with full results of the HSI assessment contained within **Appendix 2.2B** of this report. The locations of these ponds are shown in **Appendix 2.2A, Figure 2.2.1**.

Table 4: HSI Results

POND ID	SCORE	SUITABILITY
2	0.45	Poor
3	0.51	Below average
5	0.44	Poor
9	0.44	Poor
10	0.58	Below average
11	0.56	Below average
12	0.71	Good
13	0.47	Poor
14a*	0.40	Poor
15	0.65	Average

* Of ponds 14a to 14d, pond 14a was assessed as being the most suitable for GCN. Given that it was of poor suitability, full HSI values were not subsequently calculated for ponds 14b, 14c and 14d.

eDNA Survey

1.63. Test results for the pond sampled (pond 12) are given in **Table 5** below. The pond tested negative, signifying likely absence of GCN. Sample checks revealed no problems with sampling and no DNA degradation, indicating that false negative results from the samples were unlikely.

Table 5: Environmental DNA Test Results

POND ID	SAMPLE INTEGRITY AND DEGRADATION CHECKS	INHIBITION CHECK	GCN EDNA PRESENCE
P12	Pass	Pass	Negative

1.64. Ponds with an average HSI score are usually also subject to eDNA survey, where possible. However, pond 15 is part of the stream system along the northern boundary of the Application Site, with water apparently flowing through the pond all year. GCN can be found in slow-flowing water, and could therefore use this pond at certain times of year, when flow rates are low. However, ponds subject to significant inflow may be 'contaminated' by newt eDNA from ponds upstream[16]. Given the flow into pond 15, the pond was not considered suitable for eDNA testing.

[16] Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014) Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

IMPACT ASSESSMENT

1.65. Development has the potential to have long-term impacts on GCN. The most common long-term impacts on this species are direct habitat loss and fragmentation. Major habitat loss can lead to:

- reduced breeding and recruitment, e.g. fewer young, maturing individuals and fewer adults joining the breeding population, leading to fewer breeding adults;
- reduced foraging opportunities;
- fewer refuges, leading to increased exposure to predators or harsh conditions;
- unsuccessful hibernation;
- population fragmentation.

1.66. Other long-term impacts can include:

- changes to habitats, e.g. by tidying up semi-natural habitats for recreational or aesthetic reasons;
- habitat fragmentation and isolation, e.g. by creating physical barriers that newts can't cross;
- accidentally or deliberately introducing fish or invasive plants like *Crassula helmsii* to breeding ponds;
- more people using the area, e.g. to dump rubbish;
- changes to the water table;
- increased siltation;
- increased shading;
- increased chemical run-off;
- fewer prey items.

1.67. GCN have a preference for terrestrial habitat that provides good invertebrate populations for food and offers cover to decrease the likelihood of predation. The majority of terrestrial habitat within the Survey Area comprises arable fields and pasture, which are sub-optimal habitats for GCN. Areas of optimal habitat within the Application Site are limited to hedgerows, scrub and woodland close to the ponds (see **Technical Appendix 2A, Figure 2.3**).

However, assessing terrestrial habitat use by GCN is difficult. Even habitats that appear to be unsuitable, for example those that lack cover and food, may be traversed and used for dispersal.

1.68. No ponds will be lost during any phase of the Proposed Development. No optimal habitats will be fragmented by the construction of the Proposed Development, with the exception of a small amount of hedgerow. 10.6m of hedgerow will be removed at the access point of the Proposed Development.

1.69. The proposed cable route will also cross two drains (west of Target Note 7 and southwest of Target Note 20 on **Technical Appendix 2A, Figure 2.3**), and the proposed access track will cross a flowing ditch (east of Target Note 9). These may provide foraging habitat for locally present amphibians but, as noted above, are not considered suitable for breeding GCN.

1.70. Moreover, it is considered that GCN are likely to be absent from the Application Site. The surveys conducted in 2020 found one pond to be of good GCN suitability, one pond to be of average GCN suitability, four ponds of below average suitability, and four ponds / pond clusters of poor suitability. The one pond subjected to eDNA survey tested negative for GCN eDNA. This demonstrates the likely absence of the species from the pond and nearby terrestrial habitats.

1.71. There is some possibility that GCN could use pond 12 (average suitability but unsuitable for eDNA testing), or terrestrial habitat within the Application Site. However, given that GCN were not recorded within the most suitable pond in the Survey Area, it is considered that this possibility is rather limited.

1.72. Considering the nature of the Proposed Development, **no significant adverse effects** upon GCN are predicted as a result of development.

1.73. As a precautionary measure, where sections of hedgerow are to be removed, this should occur in suitable weather conditions, using hand tools and, if possible, during the amphibian active season (which in Wales is usually March to September, dependent on weather). Owing in part to the potential presence of common reptile species (see main text of **Technical Appendix 2A: Ecological Impact Assessment**), suitable weather has been defined as when air temperature is above 10°C (although this can be lower for newts) and not after prolonged dry spells.

1.74. A suitably experienced ecologist should be contacted if amphibians are found. Any amphibians found should be moved carefully by an ecologist to suitable retained habitat in the vicinity or, if already present, to one of the herptile hibernacula to be created within the Application Site (see **Figure 1.23 of Technical Appendix 1 (LVA): Volume 3** and **Technical Appendix 2B: Volume 3**). Works in the area should stop immediately in the very unlikely event that GCN are found.

1.75. If this work needs to occur between October and February, dismantling/removal will be overseen by a suitably qualified and experienced Ecological Clerk of Works.

1.76. With the implementation of the proposed Ecological Design Strategy (**Technical Appendix 2B**), it is anticipated that there will be a **net gain for biodiversity** in line with Future Wales policies 9, 17 and 18, paragraph 6.4.5 of Planning Policy Wales 11[17] and policies GI1 and NE1 of the Monmouthshire Council Local Development Plan**.** This will be through:

- Creation of new meadow, species-rich grassland and scrub over existing arable habitat, providing new shelter and foraging resources;
- SuDS creation with appropriate native species planting;
- Creation of herptile hibernacula;
- Measures to increase invertebrate numbers, increasing potential herptile prey availability.

1.77. The proposals will therefore create opportunities for amphibians, including smooth newt and any GCN present in the local area.

[17] https://gov.wales/planning-policy-wales

CONCLUSION

1.78. The surveys completed in May and June 2020 confirmed the likely absence of GCN from the Application Site. There is some limited possibility that GCN could use pond 12 and terrestrial habitat within the Application Site. An adjacent landowner reported that a population of smooth newts uses pond cluster 14a to 14d (see **Figures 2.2.1, Appendix 2.2A**).

1.79. No ponds will be lost during the construction, operation or decommissioning phases of the Proposed Development. With the exception of the removal of 10.6m of hedgerow (from a single hedge).

1.80. **No significant adverse effects** are predicted upon GCN as a result of the Proposed Development.

1.81. As a precautionary measure, works involving the removal of potential GCN sheltering/hibernation habitats should be carried out in suitable weather conditions using hand tools and, if possible, during the amphibian active season. If the work needs to occur between October and February, dismantling/removal will be overseen by a suitably qualified and experienced ECoW.

1.82. In the very unlikely event that GCN are discovered during the course of construction, works in the area should stop immediately and an ecologist be contacted for advice.

1.83. With the implementation of the **Ecological Design Strategy ("EDS")** that is provided with the planning application, it is anticipated that there will be a **net gain for biodiversity aligning with policies 9, 17 and 18 of Future Wales, paragraph 6.4.5 of Planning Policy Wales 11 and policies GI1 and NE1 of the Monmouthshire Council Local Development Plan.** The proposals will enhance habitats within the Application Site and create opportunities for amphibians including smooth newt and GCN.

APPENDICES

Appendix 2.2A – Figures

- Figure 2.2.1 – Pond Map

Appendix 2.2B – HSI Assessment Results

Appendix 2.2C – Photographs

Appendix 2.2A: Figures

Penpergwm Solar Farm
Pond Map
Figure 2.2.1

Key

- Development Boundary
- Ponds
- Orginal 500m Buffer
- 250m Buffer

0 0.25 0.5 1 Kilometer

Neo Office Address:
Cinnamon House, Crab Lane, Warrington WA2 0XP

Date: 28/04/2021
Drawn By: Dara Dunlop
Scale (A3): 1:8,000
Drawing No: NEO00668/015I/B

neo ENVIRONMENTAL

Appendix 2.2B: HSI Assessment Results

APPENDIX 2.2B – HSI ASSESSMENT RESULTS

Table 2.2.1 GCN HSI Survey Results

POND ID	2	3	5	9	10	11	12	13	14A
SI_1 LOCATION	Zone B (0.5)	Zone B (0.5)	Zone B (0.5)	Zone B (0.5)	Zone B (0.5)	Zone B (0.5)	Zone B (0.5)	Zone B (0.5)	Zone B (0.5)
SI_2 POND AREA	52m^2 (0.1)	90m^2 (0.5)	141m^2 (0.28)	555m^2 (1.0)	450m^2 (0.82)	186m^2 (0.39)	523m^2 (1.0)	35m^2 (0.05)	15m^2 (0.05)
SI_3 POND DRYING	Rarely (1.0)	Never (0.9)	Rarely (1.0)	Sometimes (0.5)	Sometimes (0.5)	Annually (0.1)	Never (0.9)	Annually (0.1)	Sometimes (0.5)
SI_4 WATER QUALITY	Poor (0.33)	Poor (0.33)	Bad (0.01)	Moderate (0.67)	Poor (0.33)	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)	Poor (0.33)
SI_5 SHADE	100% (0.2)	90% (0.4)	10% (1.0)	50% (1.0)	75% (0.7)	60% (1.0)	25% (1.0)	0% (1.0)	100% (0.2)
SI_6 FOWL	Absent (1.0)	Absent (1.0)	Absent (1.0)	Major (0.01)	Minor (0.67)	Minor (0.67)	Absent (1.0)	Absent (1.0)	Absent (1.0)
SI_7 FISH	Possible (0.67)	Possible (0.67)	Absent (1.0)	Possible (0.67)	Possible (0.67)	Possible (0.67)	Minor (0.33)	Possible (0.67)	Possible (0.67)
SI_8 POND COUNT	1.59/km^2 (0.77)	1.59/km^2 (0.77)	4.46/km^2 (1.0)	3.82/km^2 (0.99)	3.82/km^2 (0.99)	1.91/km^2 (0.83)	3.18/km^2 (0.96)	1.91/km^2 (0.83)	3.82/km^2 (0.99)
SI_9 TERRESTRIAL HABITAT	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)	Moderate (0.67)
SI_{10} MACROPHYTES	1% (0.31)	0% (0.3)	0% (0.3)	5% (0.35)	2% (0.32)	80% (1.0)	20% (0.5)	55% (0.85)	1% (0.31)
SCORE	0.45	0.51	0.44	0.44	0.58	0.56	0.71	0.47	0.40

SUITABILITY FOR GCN	Poor	Below average	Poor	Poor	Below average	Below average	Good	Poor	Poor

* Component scores multiplied and tenth root taken.

Appendix 2.2C: Photographs

APPENDIX 2.2C - PHOTOGRAPHS

Photograph 1: Pond 2

Photograph 2: Pond 3

Photograph 3: Pond 5

Photograph 4: Pond 9

Photograph 5: Pond 10

Photograph 6: Pond 11

Photograph 7: Pond 12

Photograph 8: Pond 13

Photograph 9: Ponds 14a (front left) and 14b (rear right)

Photograph 10: Pond 14c / 14d

Appendix 2.3: Protected Species Survey Summary

Cyfoeth Naturiol Cymru Natural Resources Wales

Protected species survey summary and assessment form

Applicant name	Great House Energy Centre Limited
Site name	Penpergwm Solar Farm
Site grid reference	E332954, N211435 / SO 32954 11435
Consultant name and survey licence number	Dara Dunlop / Daniel Flenley (n/a)
Planning application type (if known)	Full
Planning application reference (if known)	

Briefly state the purpose of the report (including client's brief) and the work undertaken.

Neo Environmental Ltd was appointed by Great House Energy Centre Limited to undertake protected species surveys and reporting for a solar farm and associated infrastructure.

Protected species scoping results are included within **Technical Appendix 2A: Ecological Assessment.** The aims of this report included to identify any actual or potential habitat or species constraints pertinent to the development of the Application Site and to identify how the Proposed Development can avoid, mitigate and, if necessary, compensate for impacts on these actual or potential constraints.

The purpose of **Appendix 2.1: Bat Survey Report** is to document the bat species present and the relevant levels of bat activity within the survey area associated with the Proposed Development.

Appendix 2.2: Great Crested Newt Survey Report presents the baseline findings from the 2020 survey season within the GCN Survey Area of the Proposed Development and provides subsequent recommendations.

Summary of the survey work undertaken:

A phase 1 habitat survey, with species scoping was undertaken in June 2020, using the following guidance:

- JNCC (2010) Handbook for Phase 1 Habitat Survey
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine.

Bat activity surveys were undertaken in the bat activity season 2020 by experienced field ecologists. Three dusk transect surveys were carried out between August and October, and static detector monitoring was also carried out in September and October.
The guidance below was followed:

- Bat Conservation Trust (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, 3rd Edition
- Natural Resources Wales (NRW) Approach to Bats and Planning: GPG 3

Great Crested Newt surveys were conducted by an experienced field ecologist with a GCN survey licence. The work was carried out by Daniel Flenley BSc (Hons) MPhil Grad

CIEEM (Natural England Level 2 class licence 2015-16773-CLS-CLS). No tasks requiring a separate Welsh licence were carried out.
A habitat suitability index (HSI) of onsite and accessible offsite ponds and wet ditches was carried out in May 2020. Methods followed the Amphibian and Reptile Groups of the United Kingdom's Advice Note 5: Great Crested Newt Habitat Suitability Index
One pond was rated as having good suitability for GCN and was sampled for eDNA testing. SureScreen laboratory analysis was conducted in line with the applicable Department for Environment, Food & Rural Affairs ("DEFRA") standards, and results were received on 7th May 2020.
The following guidance was used:

- Langton, T.E.S., Beckett, C.L., & Foster, J.P. (2001) Great Crested Newt Conservation Handbook. Froglife, Halesworth.
- English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough

Survey Type	Dates	Departure from guidance*
Phase 1 Habitat Survey	18/06/2020	Yes ☐ No ☒
Bat Activity Transect Surveys	31/08/2020 22/09/2020 27/10/2020	Yes ☐ No ☒
Bat Activity Static Surveys	28/09/2020 – 03/10/2020 27/10/2020 – 31/102020	Yes ☐ No ☒
Great Crested Newt (GCN) Surveys	01/05/2021	Yes ☐ No ☒
		Yes ☐ No ☐

*Any departure from guidance must be fully qualified within the main body of the report

Summary of the Reports Results:

Please note: only record the negative presence of a species below if there is a medium or high likelihood of that species being present at the site. Please then provide your assessment of the 'likelihood of presence'* below.

Species	**Number**	**Likelihood of presence*** (Low, medium, high)	**Impact assessment** (Low, medium, high)	**Functionality of site** (e.g. breeding, hibernation, resting place and/or place of shelter, foraging, dispersal routes)	**Current conservation status of site** (Favourable, unfavourable, or unknown)
Badger (*Meles meles*)	0	High	Low	Potential commuting and foraging	Unknown
Otter (*Lutra lutra*)	0	Medium	Low	Potential commuting and/or place of shelter	Unknown
Common Pipistrelle (*Pipistrellus pipistrellus*)	1+	High	Low	Commuting and/or foraging	Unknown
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	1+	High	Low	Commuting and/or foraging; possible roosting	Unknown
Nathusius' Pipistrelle (*Pipistrellus nathusii*)	1	High	Low	Commuting and/or foraging	Unknown
Myotis Bat (*Myotis* sp.)	3+	High	Low	Commuting and/or foraging	Unknown

Long-eared Bat (*Plecotus* sp.)	1+	High	Low	Commuting and/or foraging	Unknown
Lesser Horseshoe Bat (*Rhinolophlus hipposideros*)	1+	High	Low	Commuting and/or foraging	Unknown
Noctule (*Nyctalus noctula)*	1+	High	Low	Commuting and/or foraging	Unknown
Leisler's Bat (*Nyctalus leisleri*)	1+	High	Low	Commuting and/or foraging; possible roosting	Unknown
Serotine (*Eptesicus serotinus*)	1+	High	Low	Commuting and/or foraging	Unknown

It is considered that great crested newts are likely to be absent from the Application Site.

Summary of the report's recommendations and conclusions:

Otter presence may occur occasionally along the drain corridor north of Fields 1, 3 and 4. However, within the Application Site this is considered likely to be limited to foraging, commuting and other non-breeding activities, and only in this immediate boundary area. There is some potential for any otters using the site during the construction phase to become trapped in trenches excavated during works.

No clear evidence of badgers was recorded during surveys. However, badger is a highly mobile species and is known to be present in the local area. The species may therefore forage or commute through the site. It is recommended that a pre-construction badger survey is undertaken to assess the presence of badger immediately before construction. Any necessary mitigation will then be designed in accordance with relevant ecological guidance and legislative requirements.

During the construction process, all dug ground should be levelled and compacted wherever possible. All excavations are to be covered or closed off securely at the end of each working day to prevent the accidental trapping of badgers or otters.

It is not proposed that any trees with bat roost potential ("BRP") will be removed at the Application Site. If any mature tree ultimately requires removal, it will need to be surveyed for BRP prior to removal. In line with Bat Conservation Trust guidelines, further surveys will be required should this BRP check determine the tree to be of medium or high bat roosting potential. Soft felling techniques will be used if low potential exists to ensure that no cavities are cut through, and branches or trunk pieces with cavities are lowered carefully to the ground and left with the access hole upward facing over night to allow any bats to leave.

After mitigation and enhancements, residual effects on badgers are considered to be minor positive. Residual effects on otters are considered negligible to minor positive. Residual effects upon bats are envisaged to be significant and positive. Residual effects upon herptiles are envisaged to be significant and positive.

Please fill answers as Yes / No / blank for N/A

	Has the report identified the need for the following measures?									Please fill out, for European Protected Species.		
Species	Avoidance	Mitigation	Compensation	Monitoring	Long term measures	Ecological Compliance Audit	Biosecurity measures	Further Survey Required?	Detrimental to FCS? *	EPS derogation licence required?	Is there a valid derogation purpose?	Are there satisfactory alternatives to the development?
Badger	No	Yes	No	No	No	No	No	Yes	No			
Otter	Yes	No	No	No	No	No	No	No	No	No		
Common Pipistrelle	Yes	Yes	No	No	No	No	No	No	No	No		
Soprano Pipistrelle	Yes	Yes	No	No	No	No	No	No	No	No		
Nathusius' Pipistrelle	Yes	Yes	No	No	No	No	No	No	No	No		
Myotis Bat (*Myotis* sp.)	Yes	Yes	No	No	No	No	No	No	No	No		
Long-eared Bat sp.	Yes	Yes	No	No	No	No	No	No	No	No		
Lesser Horseshoe Bat	Yes	Yes	No	No	No	No	No	No	No	No		
Noctule	Yes	Yes	No	No	No	No	No	No	No	No		
Leisler's Bat	Yes	Yes	No	No	No	No	No	No	No	No		
Serotine	Yes	Yes	No	No	No	No	No	No	No	No		

Please confirm whether there are any further details (for example. reserved matters, by condition) to be submitted and provide details below:

None foreseen, though pre-construction badger survey may form a pre-commencement condition

Name	Dara Dunlop, Daniel Flenley
Date	27.04.2021

GLASGOW - HEAD OFFICE

Wright Business Centre, 1 Lonmay Road, Glasgow G33 4EL
T: 0141 773 6262
www.neo-environmental.co.uk

N. IRELAND OFFICE

83-85 Bridge Street
Ballymena, Co. Antrim
Northern Ireland
BT43 5EN
T: 0282 565 04 13

IRELAND OFFICE

Johnstown Business Centre
Johnstown House, Naas
Co. Kildare
T: 00 353 (0)45 844250
E: info@neo-environmental.ie

RUGBY OFFICE

Valiant Office Suites
Lumonics House, Valley Drive,
Swift Valley, Rugby,
Warwickshire, CV21 1TQ
T: 01788 297012

WARRINGTON OFFICE

Cinnamon House, Cinnamon Park
Crab Lane, Fearnhead
Warrington
Cheshire
T: 01925 661 716