

6 BIODIVERSITY

6.1 INTRODUCTION

6.1.1 This Chapter of the ES has been prepared in relation to the Proposed Development as described in Chapter 4: Proposed Development and Alternatives Considered. Information has been gathered from desk study and Extended Phase 1 habitat survey, to establish the likely presence or likely absence of protected or notable species, identify statutory and non-statutory designated sites for nature conservation in the vicinity of the Application and evaluate the overall conservation status of the land within and adjacent to the Application Site. The potential for the Proposed Development to have an effect either alone or in combination with other projects on designated sites and protected and notable habitats and species is assessed and mitigation measures set out where relevant. Opportunities for biodiversity enhancement are also described.

6.1.2 Information has been compiled from a desk study, habitat and species surveys to enable the determination of the likely ecological effects of the Proposed Development.

6.2 ASSESSMENT APPROACH

Methodology

6.2.1 The ecological impact assessment (EcIA) has been undertaken with reference to applicable wildlife and countryside legislation, national and local planning policy and the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) guidance¹. The assessment methodology also reflects the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) and focuses on those activities that could potentially generate significant effects on ecological features. For the purpose of the assessment, the terms 'impacts' and 'effects' are referred to in accordance with the definitions set out in the CIEEM Guidelines as follows:

- Impact: Actions resulting in changes to an ecological feature, for example, removing a hedgerow;
- Effect: Outcome to an ecological feature from an impact, for example, the changes experienced by the local population of a species arising from the loss of the hedgerow.

Zones of Influence

6.2.2 The 'zone of influence' for the project is the area over which ecological features may be affected by biophysical changes as a result of the proposal and associated activities. The zones of influence that extend beyond the direct land-take required for the Proposed Development have been identified based upon the nature of the completed project and the construction activities to be undertaken, informed by the consultation and Scoping process and current

¹ Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment I the UK and Ireland, Terrestrial, Freshwater, Coastal and Marine. CIEEM (2018).

CIEEM and Natural England guidance where available. The zone of influence will therefore vary for different ecological features depending on their sensitivity to an environmental change. The identified zones of influence were used to establish the scope of baseline ecological surveys and the extent of survey area and desk study.

6.2.3 Zones of influence for the Site and the Proposed Development that have been considered are as follows:

- Desk study - designated sites within 5km, extended to 10km for European Sites (Special Protection Areas (SPAs) or Special Areas of Conservation (SACs) and including Ramsar sites);
- Desk study - non-statutory designated sites, protected and notable habitats and species (e.g. Environment (Wales) Act 2016 Species of Principal Importance and Priority Habitats) within 2km;
- Field survey habitats - land within Site and immediately surrounding habitats where these could be surveyed from publicly accessible land or with third party permission;
- Field survey badgers - Site and adjacent land within at least 30m where access permitted;
- Field survey great crested newts - on-Site ponds and accessible ponds within 250m of Site;
- Field survey wintering birds - Site and surrounding fields to 600m where access where land could be viewed from public land
- Field survey breeding birds - Site and adjacent boundary habitats;
- Field survey otter and water vole - on-Site watercourses, ponds and ditches; and,
- Field survey of trees for their bat roost potential - Site and adjacent boundary habitats.

6.2.4 Ecological Impact Assessment (EcIA) is defined within the CIEEM guidelines as

“...a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems”.

6.2.5 The EIA Regulations² require the description of the ‘likely significant environmental effects of the proposed development on the environment’ (Regulation 18(3)(b)).

Assessment of Significance

6.2.6 To determine the overall significance of each ecological effect, judgements on the sensitivity of the receptor(s) and the magnitude of impact from the Proposed Development are considered together in order to determine whether or not an effect is likely to be significant. This involves a combination of quantitative and qualitative assessment and the application of professional judgement.

² Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended).

6.2.7 For the purposes of this assessment, effects are categorised as significant or not significant in line with the EIA Regulations. The assessment considers effects at different geographic scales i.e. where effects may be discernible at a local scale but are not considered significant in the context of the EIA Regulations. For the purpose of the assessment, moderate and major effects are deemed to be 'significant' in EIA terms unless stated otherwise.

6.2.8 A 'significant effect' is considered to be an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general.

6.2.9 CIEEM guidelines on ecological impact assessment note that:

“A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures.”

6.2.10 For ease of reference, **Table 6.1** sets out adapted CIEEM terminology, which also shows the equivalent EIA terms as used in this Chapter.

Table 6.1: Summary of Significance Levels

Effect (Standard EIA-related terminology and associated assigned significance)		Equivalent CIEEM terminology adapted for Ecological Assessment
Negligible	Neutral	No discernible or significant on ecological integrity or conservation status (e.g. species or habitat).
Minor Adverse	Not Significant	Adverse effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only.
Moderate-Major Adverse	Significant	Adverse effect on ecological integrity or conservation status at a County, National or International geographic scale.

6.2.11 The Proposed Development has been assessed as having a lifetime of 37 years for the purpose of this assessment and ecological effects have been described in terms of their duration as short, medium term and long-term as follows:

- Short term effects are defined as 0 - 3 years;
- Medium term effects are defined as 3 - 15 years; and
- Long term effects are defined as > 15 years

6.2.12 The ecological impact assessment includes:

- An evaluation of identified important ecological features and potential receptors; faunal species, habitats and vegetation (as appropriate) on an international, national and regional basis;

- A description and evaluation of the potential effects of the Proposed Development on statutory and non-statutory sites designated for nature conservation;
- A description and evaluation of the potential effects of the Proposed Development on species and habitats;
- Mitigation measures implemented to address any identified significant adverse effects;
- An assessment of cumulative effects;
- Identification of any residual effects after mitigation; and
- Identification of opportunities for biodiversity enhancement.

6.2.13 For the purposes of this assessment the importance or sensitivity of an ecological feature is considered within the context of a defined geographical area, ranging from International (high value) to Site (low/negligible), as detailed in **Table 6.2**.

Table 6.2: Value/Sensitivity Assessment

Value or Sensitivity of Receptor / Geographic Scale of Importance	Definition examples
High - International / European	Greater than a UK scale, typically valued at a European level such as internationally designated sites (Special Protection Areas (SPA), Special Areas of Conservation (SAC) and/ or Ramsar sites) or proposed/ candidate site (pSPA or cSAC), large area of a habitat listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of the larger whole, large population of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) or species listed in Annex IV of the Habitats Directive.
High - National (Wales/UK)	Wales/UK: A nationally designated site (e.g. Site of Special Scientific Interest) or a discrete area which meets the selection criteria for national designation. An area of a priority habitat listed under the Environment (Wales) Act 2016 which constitutes a significant proportion of the resource of that habitat in Wales or the UK as a whole. A regularly occurring, regionally significant population of any nationally important species listed as a UK BAP / Biodiversity List and priority species listed under the Environment (Wales) Act 2016, and Species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.
Medium Regional / County (Denbighshire)	Locally designated sites (Local Nature Reserves, County or Local Wildlife Sites). Areas of priority habitat which constitutes a significant proportion of the County's resource of that habitat. A regularly occurring, locally significant population of any nationally important species listed as a UK BAP / priority species and priority species listed under the Environment (Wales) Act 2016, and Species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.
Low - Local	Local area around the Site. For example areas of priority habitat which are not large enough to meet the criteria for County value, or small but sustainable populations of a protected or notable species
Low/Negligible - Site	Within the Site. Features present but of value in relation to the Site only

6.2.14 Effects on ecological features have been assessed based upon the interaction between the importance, or sensitivity, of the feature and the magnitude of change it is likely to experience. In accordance with the CIEEM guidelines (2018), an EcIA need only assess in detail, impacts upon important ecological features i.e. those that are considered important and potentially affected. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable. Where ecological features are not considered important enough to warrant further consideration, or where they will not be significantly affected, these are scoped out of the assessment presented here, and justification for exclusion is provided.

6.2.15 Relevant European, national and local guidance from governments and specialist organisations has been referred to in order to determine the importance (or 'sensitivity') of ecological features. Importance has also been determined using professional judgement and taking account of the results of baseline surveys and the functional role of features within the context of the geographical area.

6.2.16 Importance does not necessarily relate solely to the level of legal protection that a feature receives and ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.

6.2.17 Once identified, potential impacts are described making reference to the following characteristics as appropriate: positive or negative, extent, magnitude, duration, timing, frequency, and, reversibility. The judgements on magnitude may need to be adjusted (either up or down) to reflect the duration of the change (i.e. short, medium or long term) and whether it is potentially reversible. The assessment also identifies areas where no change is anticipated and the resulting effect is described as 'not discernible' or 'none'.

6.2.18 Ecological effects are described as far as possible and where available information allows in terms of the parameters detailed in **Table 6.3**.

6.2.19 Magnitude of effect, based on the effects that the Proposed Development would have upon the resource/receptor, is considered within the range of high, medium, low, negligible. Consideration is given to scale, duration of impact/effect (and extent of Proposed Development with reference to the definitions in **Table 6.2**). The assessment considers how existing baseline conditions may change over time, as for example the baseline conditions could alter through operational land use, in the form of differing management and natural growth or succession of habitats.

Table 6.3: Environmental Parameters

Environmental Parameter	Description
Magnitude	The 'size' or amount of the effect is referred to as the magnitude and is determined on a quantitative basis where possible supported by professional judgement.
Extent	The area over which an effect occurs. The magnitude and extent of an effect may be synonymous
Duration	The time over which an effect is expected to last prior to the recovery or replacement of the ecological receptor. This can be considered in terms of life cycles of species or regeneration of habitats. The duration may be longer than the duration of an activity.
Reversibility	Reversible (or temporary) effects are those that occur during the lifetime of the development and where spontaneous recovery or mitigation allows recovery within a reasonable timescale. Permanent effects are those which cannot be recreated within the proposed development or there is no reasonable chance that actions can be undertaken to reverse it.
Timing and Frequency	The timing of effects in relation to important seasonal and/or life cycle constraints. The frequency with which activities and simultaneous effects would take place can be an important determinant.

6.2.20 The assessment of effects is based upon the assessments of magnitude of effects and sensitivity of the resource/receptor to come to a professional judgement of how important this effect is. The magnitude of change effected on ecological receptors is described as set out in **Table 6.4**. The likelihood or probability that an effect will occur is addressed as far as possible based on available information. Whilst it is reasonably straightforward to identify effects that are certain to occur, or conversely will not occur, it is generally more difficult to assign a quantified level to occurrences defined as likely, unlikely or highly unlikely. In these circumstances, professional judgement has been used, with reasoning supported by available evidence.

Table 6.4: Magnitude of Impact/Change

Magnitude	Criteria
High	The change may negatively or positively affect the conservation status of a site or species population, in terms of the coherence of its ecological structure and function, that sustains the habitat, complex of habitats and/or the population levels of species of interest.
Moderate	Conservation status of a site or species population will not be negatively or positively affected, but some element of the functioning of the site or population might be affected and the change to the site/ population is likely to be significant in terms of its ability to sustain some part of itself in the long term.
Low	Neither of the above applies, but some minor negative or positive change is evident on a temporary basis, or the change affects extent of habitat or individuals of a species abundant in the local area.
Negligible	No observable effect in either direction

6.2.21 For an effect to be significant, the ecological integrity or conservation status of a sensitive feature must be influenced in some way. It may be that the effect is substantial in magnitude or scale, irreversible, has a long-term effect, or coincides with a critical period in a species' life-cycle. Where uncertainty or limitations exist, this is acknowledged.

6.2.22 It is recognized that discernible effects can also occur at a local geographic scale which are not sufficiently severe to be assessed as 'significant' in accordance with the EIA approach, and do not require specific mitigation, but nonetheless merit discussion. In the interest of completeness these effects are discussed in Chapter 6: Biodiversity in relation to general construction good practices to be adopted to avoid or minimise low-level or minor disruption to local features, including for example standard pollution prevention and control measures.

Legislative and Policy Framework

6.2.23 Reference has been made to the following key pieces of legislation, planning policy and guidance summarised as follows.

European Legislation

6.2.24 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as the 'Habitats Directive'); and Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (codified version of Directive 79/409/EEC as amended) (hereafter referred to as the 'Birds Directive'). The Directives are implemented into national legislation under The Conservation of Habitats and Species Regulations 2017, as amended (hereafter the 'Habitat Regulations').

6.2.25 The Habitat Regulations provide a framework of protection for European statutory designated sites (primarily Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), referred to as Natura 2000 or Natura sites) and rare species (referred to as European Protected Species (EPS)). This may also be referred to as the 'Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. For the purposes of this report these two references are interchangeable and hereafter referred to as the 'Habitat Regulations'

6.2.26 The legislation has been considered within the assessment with regards to the potential for direct harmful effects on EPS, for example great crested newts, or indirect effects on Natura Sites.

National Legislation

6.2.27 The Wildlife and Countryside Act 1981 (WCA) is the primary legislation which protects animals, plants and habitats in the UK.

6.2.28 The Countryside and Rights of Way (CROW) Act 2000 primarily relates to public access to the countryside, but also amended existing law (the WCA) relating to nature conservation and the protection of wildlife under Part III, which is concerned with the introduction of improved protection and management of SSSIs.

6.2.29 Environment (Wales) Act 2016 provides legislation to plan and manage Wales' natural resources. Section 7 of the Act requires Ministers to publish and maintain lists of species and habitats in Wales that are regarded as being of 'principal importance' for the purpose of maintaining biodiversity (replacing the duty originally set out in Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 6 provides an enhanced biodiversity duty on public authorities to maintain and enhance biodiversity and promote the resilience of ecosystems.

6.2.30 The Protection of Badgers Act 1992 makes it an offence to kill injure or take a badger from the wild. It is also an offence to damage or interfere with a sett unless a licence is obtained from a statutory authority. The Act was considered within the baseline survey methodology and the assessment so as to ensure no offence is committed, for example through disturbance of a badger sett.

6.2.31 The Hedgerows Regulations 1997 restrict the removal of hedgerows, or parts of hedgerows which are over 20m in length. As such the regulations are relevant to the application only in the event of a requirement for hedgerow removal. The presence or otherwise of hedgerows was established through field surveys. The legislation does not give a clear definition of the term 'hedgerow', but only applies to country hedgerows, which includes hedgerows next to nature reserves and SSSIs.

Planning Policy

6.2.32 The Nature Recovery Plan for Wales includes objectives to help guide actions to comply with this Section 6 duty.

6.2.33 National Policy is set out within the Welsh Government's Planning Policy Wales, Edition 11 (PPW11, 2021³). Biodiversity is addressed in Chapter 6.4 Biodiversity and Ecological Networks which highlights the duty of public authorities under the Environment (Wales) Act 2016 towards enhanced biodiversity and resilience of ecosystems and states (Para 6.4.2):

"The Nature Recovery Action Plan supports this legislative requirement to reverse the decline in biodiversity, address the underlying causes of biodiversity loss by putting nature at the heart of decision-making and increasing the resilience of ecosystems by taking specific action focused around the 6 objectives for habitats and species."

6.2.34 Paragraph 6.4.8 notes also:

"A proactive approach towards facilitating the delivery of biodiversity and resilience outcomes should be taken by all those participating in the planning process. In particular, planning authorities must demonstrate that they have sought to fulfil the duties and requirements of Section 6 of the Environment Act by taking all reasonable steps to maintain and enhance biodiversity in the exercise of their functions.."

6.2.35 Denbighshire Local Development Plan 2006-2021 contains policies relevant to the natural environment and biodiversity including:

- Policy VOE 1 – Key Areas of Importance (such as statutory designated sites for nature conservation and local areas identified because of their natural landscape or biodiversity value); and,
- Policy VOE 5 Conservation of natural resources (requiring biodiversity statements to accompany development proposals and mitigation to address likely adverse effects on designated sites, priority habitats and species, geodiversity sites or species that are under threat.

6.2.36 Denbighshire Supplementary Planning Guidance Note Conservation and Enhancement of Biodiversity (July 2016)⁴ sets out biodiversity guidance for new developments outlines the Council's expectations with regard to the biodiversity information to be submitted with a planning application, scope and standards of submitted ecological surveys; and outlines potential additional legal duties on developers as a result of obtaining planning consent.

Key Guidance

6.2.37 The following key guidance has been considered in the context of the assessment:

³ https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf

⁴ <https://www.denbighshire.gov.uk/en/resident/planning-and-building-regulations/local-development-plan/ldp-spg/spg-documents/adopted-spg-documents/Supplementary-Planning-Guidance-Note-Conservation-and-Enhancement-of-Biodiversity-v2.pdf>

- 'Birds of Conservation Concern in Wales 3' (Johnstone. I & Bladwell. S., 2016)⁵ and 'Birds of Conservation Concern 4' (Eaton *et al.*, 2015)⁶; which identify those species which are particular conservation priorities at national level and UK levels.
- UK Biodiversity Action Plan (UKBAP), as succeeded by The 'UK Post-2010 Biodiversity Framework'. The lists of priority species and habitats agreed under UK BAP still form the basis of much biodiversity work and are therefore considered within this Chapter in the context of the objectives of the Biodiversity Framework. BAPs identify habitats and species of nature conservation priority on a UK (UK BAP) and Local (LBAP) scale. UK BAPs formed the basis for statutory lists of priority species and habitats in Wales under Section 7 of the Environment (Wales) Act 2016, and so are also relevant in the context of this legislation;

6.2.38 Relevant legislation and policy has been considered within the assessment with regards to the potential for direct or indirect effects on protected species, or statutory designated sites. Baseline surveys and desk study have been undertaken to identify the presence of relevant protected species (or likely presence) and statutory designated sites which require consideration within the assessment.

Scoping Criteria

6.2.39 Consultations have been undertaken with Denbighshire Council and Natural Resources Wales (NRW) to agree and inform the scoping, survey and assessment process, these included

- NRW Scoping Opinion 14/05/2020 (**Appendix 2.1**)
- NRW Screening Direction 11/03/2020
- Denbighshire County Council Screening Direction Consultation 10/03/2020
- Emails and telephone conversations between Avian Ecology Ltd. ecologists and Denbighshire County Council's Ecology Officer (14.02.2020, 26.03.2020) and NRW regarding survey methods and scope (20.04.2020)
- NRW Pre-application Consultation response 09/10/2020.

6.2.40 Following on from the screening and scoping process, ecological features likely to be relevant to the assessment of the Proposed Development have been identified (summarised in **Table 6.8**) and considered in this Biodiversity Chapter in relation to:

- Construction Phase – land take and direct habitat loss and effects on protected or notable species;
- Construction Phase – indirect effects on habitats and protected or notable species;

⁵https://www.rspb.org.uk/globalassets/downloads/documents/wales/state-of-birds-wales-2018_bilingual.pdf

⁶ <https://www.bto.org/our-science/publications/psob>

- Construction Phase – indirect effects from changes to surface water drainage and runoff, noise and vibration, airborne emissions (dust), lighting and general human activities (disturbance);
- Operational Phase – displacement of species;
- Operational Phase – habitat creation and diversification and biodiversity net gain; and,
- Operational Phase – long-term management of habitats to benefit biodiversity and promote ecosystem resilience.

Limitations to the Assessment

6.2.41 This Chapter assesses whether or not the identified potential effects are likely to be significant in relation to the criteria set out in the EIA Regulations 2017 and the Proposed Development, as summarised in **Table 6.1**.

6.2.42 A habitat baseline was prepared based upon desk study and an Extended Phase 1 habitat survey. This type of survey does not constitute a detailed botanical survey 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:

- Broadly identify the nature conservation value of a site and assess the significance of any potential impacts on habitat/species recorded; and/or,
- Confirm the need and extent of any additional specific ecological surveys that are required to identify the true nature conservation value of a site (if any).

6.2.43 The first habitat survey visit was undertaken in November 2019 and subsequently outside the optimal period for botanical surveys (approximately April to September); therefore not all species were necessarily visible or identifiable. However, due to the Site being comprised of mainly arable farmland with low habitat diversity, and other habitats that could readily be identified at any time of year, this was not considered to be a significant constraint to the objective of the assessment.

6.2.44 Due to access constraints to third party land within the approximate cable route corridor, this area of land has been reviewed and assessed based on desk study records, online aerial imagery, and OS mapping. However sufficient evidence could be gathered in this way to be able to describe general habitats present and to inform the need or otherwise for further surveys of flora or fauna and likely impacts arising from the excavation of a narrow trench line largely located within or alongside roads and verges.

6.2.45 As a result of the Covid-19 pandemic, certain restrictions were necessary in relation to survey methods, timings and access, to reflect legal requirements in Wales at the time and to ensure the safety of surveyors and the wider public. These are not considered to have constrained baseline information gathering in any material way. A slightly amended methodology for great crested newt surveys was agreed in advance with Natural Resources Wales (email dated 20.04.2020) which nonetheless remained in accordance with published guidance.

6.2.46 No significant assumptions have been made, nor have limitations been encountered that represent a constraint to the objectives or robustness of the assessment.

6.3 BASELINE CONDITIONS

Site Description and Context

6.3.1 The Site is located on land surrounding Gwernigron Farm; to the north-west of St. Asaph and to the north-east of St Asaph Business Park. The A55 North Wales Expressway is located immediately to the south of the Site and the A525 is located immediately to the east of the Site boundaries; beyond which the (110m at its closest point) is the River Elwy which flows in a northerly directing towards the Irish Sea. The surrounding landscape is dominated by extensive arable and pastoral farmland.

6.3.2 The Site is comprised of a number of fields, bounded by hedgerows (with scattered trees), post and wire fences and/or ditches. The fields themselves consist of intensively managed arable and sheep grazed pastoral farmland. Two large areas of semi-natural and plantation broadleaved woodland are present in the western section of the Site and two smaller areas of woodland are also located within the Site boundaries. A number of scattered isolated mature trees are scattered throughout the fields; some being notably mature specimens.

6.3.3 The Site supports a number of ponds, and a small stream flows along (and immediately adjacent to) the Site's south-western boundary, bordered by a narrow belt of semi-natural broadleaved woodland.

6.3.4 In the wider context the Site is surrounded by further arable farmland and scattered pockets of deciduous woodland with a network of hedgerows, ponds and ditches present.

6.3.5 The proposed grid connection route corridor (shown in **Figure 1.2**) will run south of the Site's southern boundary, and cross the A55 before connecting to the National Grid substation and compound at Bodelwyddan.

Baseline Survey Information

6.3.6 A desk study and a series of baseline habitat and species surveys have been carried out to inform the assessment process.

Desk Study

6.3.7 A desk study was undertaken to identify any known existing features or species of ecological importance within a defined radius of the Site. The desk study included a review of relevant policy and guidance and sought to identify any statutory designated sites for nature conservation through interrogation of the Natural Resources Wales⁷, JNCC⁹ and Multi Agency Geographic Information

⁷ <https://naturalresources.wales/evidence-and-data/maps/wales-environmental-information/>

⁸ <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/>

⁹ www.jncc.gov.uk

for the Countryside (MAGIC)¹⁰ websites. A 5km Site boundary search radius was adopted for all statutory designated sites and extended to 10km for statutory designated sites of international significance.

6.3.8 Biological records data on non-statutory designated sites and records of protected and notable species have been requested from North Wales Environmental Information Service (Referred to as Cofnod). A 2km search radius was used for notable and protected species (extended to 5km for bats) using the Site boundary as a point of reference.

6.3.9 Reference was also made to Ordnance Survey maps of the wider area and online aerial images (www.google.co.uk/maps) in order to determine any features of nature conservation interest in the wider area.

Field Surveys

Extended Phase I Habitat Survey

6.3.10 An Extended Phase 1 habitat survey was undertaken on the 11th November 2019. The survey followed UK industry standard Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology (JNCC, 2010). The survey was extended to include the additional recording of specific features indicating the presence, or likely presence, of protected species, invasive species and other species of conservation significance.

6.3.11 The survey established an overall habitat baseline to help inform the need or otherwise for further surveys. Additional information was gathered during subsequent site surveys in April and May 2020 to further inform the habitat baseline.

6.3.12 The survey area included all land within the Site boundary and adjacent land where accessible and third party land within the approximate cable route corridor was reviewed and assessed using online aerial imagery, and OS mapping.

Species Surveys

6.3.13 A series of species surveys were completed between October 2019 and June 2020. Survey methodologies and findings are detailed in the following Appendices:

- **Appendix 6.1:** Technical Ornithological Appendix;
- **Appendix 6.2:** Otter and Water Vole Survey;
- **Appendix 6.3:** Great Crested Newt Survey;
- **Appendix 6.4:** Confidential Badger Report ;

¹⁰ www.magic.defra.gov.uk

6.3.14 Baseline information is illustrated in the following Figures:

- **Figure 6.1:** Statutory Designated Sites
- **Figure 6.2:** Non-Statutory Designated Sites
- **Figure 6.3:** Extended Phase 1 Habitats
- **Figure 6.4:** Wintering Bird Survey Site and Wider Survey Area
- **Figure 6.5:** Breeding Bird Survey Results;
- **Figure 6.6:** Otter and Water Vole Survey Area
- **Figure 6.7:** Great Crested Newt Survey Results Plan

Designated Sites for Nature Conservation

Statutory Designated Sites

6.3.15 The Site is not located within any statutory designated site for nature conservation. **Table 6.5** below identifies nationally and internationally designated sites within 5km and 10km search areas respectively which are also shown on **Figure 6.1**.

Table 6.5: Statutory designated Sites

Nationally Designated Sites within 5km		
Site name and designation	Distance and direction	Details
Rhuddlan Pond LNR	1.17km North	Nature reserve with ponds and meadows on former railway land
Coedydd ac Ogofau Elwy A Meirchion SSSI	1.79km South	Site of geological significance also supporting semi-natural broadleaved woodland, assemblage of rare and scarce plants, bats including lesser horseshoe bat. The SSSI also underpins the Coedwigoedd Dyffryn Elwy / Elwy Valley Woods SAC (see below)
Maes Hiraddug SSSI	4.57km North East	Of special interest for unimproved neutral grassland vegetation, which occurs in association with some small patches of woodland and scrub
Moel Hiraddug A Bryn Gop SSSI	3.79km North East	Of special interest for its geology and calcicolous grasslands, assemblages of nationally rare and scarce vascular and non-vascular plant species and four individually qualifying higher plant species, hoary rock-rose <i>Helianthemum oelandicum</i> , dark red helleborine <i>Epipactis atrorubens</i> , green winged orchid <i>Anacamptis morio</i> and autumn lady's tresses <i>Spiranthes spiralis</i>
Internationally Designated Sites within 10km		

Coedwigoedd Dyffryn Elwy / Elwy Valley Woods SAC	1.79km South	One of only three Tilio-Acerion forests in North Wales and supports an outstanding lower-plant flora. The majority of the sites comprises Ancient Semi-Natural woodland (ASNW), with areas of limestone grassland. The site supports rare plants, otter and a range of bat species including lesser horseshoe bats.
Liverpool Bay SPA	5.86km North	Liverpool Bay / Bae Lerpwl SPA borders the coastlines of northwest England and north Wales, and runs as a broad arc from Morecambe Bay to the east coast of Anglesey. It is classified for the protection of red-throated diver <i>Gavia stellata</i> , common scoter <i>Melanitta nigra</i> , and little gull <i>Hydrocoloeus minutus</i> in the non-breeding season; common tern <i>Sterna hirundo</i> and little tern <i>Sterna albifrons</i> in the breeding season, and an internationally important waterbird assemblage.
Dee Estuary SPA	8.84km North East	Qualifying for wader assemblage, specifically wintering and passage populations of shelduck <i>Tadorna tadorna</i> , teal <i>Anas crecca</i> , pintail <i>Anas acuta</i> , oystercatcher <i>Haematopus ostralegus</i> , grey plover <i>Pluvialis islandica</i> , knot <i>Calidris canutus</i> , dunlin <i>Calidris alpina</i> , black-tailed godwit <i>Limosa limosa islandica</i> , curlew <i>Numenius arquata</i> and redshank <i>Tringa totanus</i>
Dee Estuary Ramsar	8.84km North East	More than 1% of wintering bird populations of: redshank, shelduck, teal, pintail, oystercatcher, grey plover, knot, dunlin, black-tailed godwit, curlew and bar-tailed godwit <i>Limosa lapponica</i> .
Dee Estuary SAC	8.87km North East	Mudflats and Atlantic salt meadows within the wider estuary with qualifying features including populations of sea lamprey <i>Petromyzon marinus</i> , river lamprey <i>Lampetra fluviatilis</i> and petalwort <i>Petalophyllum ralfsii</i> .

6.4 NON-STATUTORY SITES

6.4.1 Cofnod provided records for seven non-statutory designated Local Wildlife Sites (LWS) within 2km of the development Site boundaries, of which the closest, Coed Cord LWS, is within 200m of the Application Site. Information on non-statutory sites is presented **Table 6.6** and shown on **Figure 6.2**.

Table 6.6: Non-statutory designated sites within 2km

Site name and designation	Distance and direction	Details
D001: Clwyd Estuary and Adjacent fields LWS	485m North	An estuary including mudflats, where large numbers of birds feed, saltmarsh, a disused tip with botanical interest and supporting ground nesting birds, and adjacent fields and water bodies which support significant numbers of wintering waders and wildfowl.
D031: Mount Road Churchyard, St Asaph LWS	663m East South East	This cemetery has neutral grassland, which has been left uncut during the summer. Species include cock's-foot <i>Dactylis glomerata</i> , common knapweed <i>Centaurea nigra</i> , pepper saxifrage <i>Silaum silaus</i> and stinking iris <i>Iris foetidissima</i> . Trees around the site include ash, oak, yew <i>Taxus baccata</i> and wild cherry <i>Prunus avium</i> .
D022: Vale Of Clwyd Grassland LWS	684m East	Floodplain grazing marsh with neutral improved and damp grassland, and an area of open water. This part of the Vale is noted for breeding shelduck <i>Tadorna tadorna</i> .
D032: Coed Cord / Coed y Saeson LWS	1.25km South	Flat, low lying, ancient woodland including alder <i>Alnus glutinosa</i> , ash <i>Fraxinus excelsior</i> , oak <i>Quercus robur</i> and birch <i>Betula sp</i> communities. Hazel <i>Corylus avellana</i> forms an extensive herb layer with hawthorn <i>Crataegus monogyna</i> and ash and elm <i>Ulmus sp</i> saplings. The herb-layer is varied with dog's mercury <i>Mercurialis perennis</i> , sanicle <i>Sanicula europaea</i> , giant fescue <i>Festuca gigantea</i> , false brome <i>Bracypodium sylvaticum</i> and early dog-violet <i>Viola reichenbachiana</i>
D033: Coed Fron and Eryl Hall Wood LWS	1.30km South	Ancient woodland with alder, ash, oak and birch communities.
D014: Ty Isa and Pen Palmant valley LWS	1.75km East	Neutral grassland grazed by cattle with cock's-foot, crested dog's-tail <i>Cynosurus cristatus</i> , common

Site name and designation	Distance and direction	Details
		knapweed, agrimony <i>Agrimonia eupatoria</i> , bird's-foot-trefoil <i>Lotus coniculatus</i> , burnet-saxifrage <i>Pimpinella saxifraga</i> , autumn hawkbit <i>Scorzoneroides autumnalis</i> and the uncommon spiny restharrow <i>Ononis spinosa</i> .
D034: Ty'n-y-Coed Rough (2 areas) LWS	1.84km South	Lowland broadleaved woodland

Habitats

Priority Habitats

6.4.2 Two habitats of Principal Importance under Section 7 of the Environment (Wales) Act 2016 (S7) and Denbighshire Habitat Action Plan (HAP) habitats were identified within 2km of the Site, as mapped on the MAGIC website and presented within the data search.

6.4.3 The Magic website provided records of one priority habitat within the Site boundary; an area of broadleaved mixed woodland habitat located towards the west of the Site.

6.4.4 Information on priority habitats within 2km of the Site is presented **Table 6.7**; where numerous records of a particular habitat were recorded, only the closest record to the Site has been provided, in order to provide context for the Site and surrounding area.

Table 6.7: Priority Habitats

Priority habitat name	Designation	Distance from site
Broadleaved Mixed Woodland	S7	On Site
Intertidal substrate foreshore	S7	1.8km North

6.4.5 The Extended Phase 1 habitat survey area is shown on **Figure 6.3** and photographs are presented in **Appendix 6.5**.

6.4.6 The fields within the Site are managed as a combination of arable crops, including turnip, winter wheat and tilled fields, as well as sheep and cow-grazed pasture. The majority of field boundaries comprise barbed wire fences, however several field boundaries are formed by species poor hedgerows, predominantly comprised of hawthorn *Crataegus monogyna*, with occasional elder *Sambucus nigra* and beech *Fagus sylvatica*. None of the hedgerows present are considered to qualify (in ecological terms) as 'important' under the Hedgerow Regulations (1997).

6.4.7 Woodland strips have been planted with birch *Betula* sp, pedunculate oak *Quercus robur*, cherry *Prunus* sp, rowan *Sorbus aucuparia*, ash *Fraxinus excelsior* and dog rose *Rosa canina*.

6.4.8 Two areas of semi-natural broadleaved woodland are located within the Site, dominated by sycamore *Acer pseudoplatanus*, pedunculate oak, blackthorn *Prunus spinosa* and goat willow *Salix caprea* with a smaller percentage of hazel *Corylus avellana*. The ground flora within the woodlands contained ivy *Hedera helix*, common nettle *Urtica dioica*, cow parsley *Anthriscus sylvestris* and bramble *Rubus fruticosus* agg and in more open areas of woodland, species-poor semi-improved grassland dominated by Yorkshire fog *Holcus lanatus*, false oat-grass *Arrhenatherum elatius* and cocks-foot *Dactylis glomerata*. In addition, there are several standalone mature trees scattered across the Site, of which all were pedunculate oak.

6.4.9 The Cofnod data search identified a number of locally notable plant species within 2km; none of these were recorded within the Site during the Extended Phase 1 habitat survey or subsequent Site survey, although it is noted that the first habitat was undertaken in November and not all plants would have been in evidence at that time. Details of plant species returned from Cofnod are presented in **Appendix 6.6**.

6.4.10 Seven ponds are located within the Site (P1-7, **Figure 6.7**) which were assessed for their habitat suitability for amphibians (**Appendix 6.3**). No further ponds were identified within 250m of the proposed development boundary on third party land.

6.4.11 Several narrow watercourses occur within the Site including wet and dry ditches with vegetated earth banks. When surveyed in November 2019 several swales and shallow ditches within fields were flooded following prolonged periods of heavy rain. By April/May 2020 however many of these ditches had dried completely with only ditch D4 (**Figure 6.6**) remaining in flow. Ditches across the Site, apart from one ('D4'), are considered likely to routinely dry out in the spring and summer.

6.4.12 No invasive species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded within the Site during the Extended Phase 1 habitat survey. No records of invasive species were returned from the desk study data search on or within 2km of the Site.

Grid Connection Route

6.4.13 The corridor for the grid connection route will run south from the Site across the A55 and towards the National Grid Bodelwyddan substation south of St Asaph Business Park. A large proportion of the route is likely to run along hardstanding and road verges with minimal intrusion into natural habitats. Habitats along and around the indicative corridor are dominated by improved pasture used for grazing or arable land. Species-poor hawthorn-dominated hedgerows comprise a large proportion of field boundaries in the area. Small pockets of semi-natural broad-leaved woodlands also occur, dominated by pedunculate oak and sycamore.

Protected and Notable Species

6.4.14 Species records received from Cofnod are included as **Appendix 6.6**. Species surveys are summarised below and full methodology and results are provided in **Appendices 6.1-6.4**.

Birds

6.4.15 Bird records provided by Cofnod included 104 species within 2km of the Site including a suite of species typical of the habitats and region. These included 45 species that are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), priority species listed on the UK Biodiversity Action Plan (UKBAP), species listed as a priority species under Annex 1 of the EU Birds Directive and red or amber listed 'Birds of Conservation Concern'¹¹. A list of protected and notable ornithological species records obtained from the 2km search area is presented in **Appendix 6.6**.

Wintering Birds

6.4.16 Due to the proximity to the internationally important areas of the Dee Estuary and Liverpool Bay, designated for internationally important assemblages of passage and over-wintering waterbirds, a series of wintering bird surveys were undertaken between October 2019 and March 2020 (**Appendix 6.1**). The surveys sought to determine the potential value of the Site and immediate surrounding land for waterbird species.

6.4.17 No target species were recorded using the Site or surrounding surveyed land. Three Secondary Species were recorded during surveys, with small numbers of three gull species using the Site to loaf and feed. Three fields in the 600m buffer zone around the Site supported relatively low numbers of gulls during the surveys.

6.4.18 No qualifying species of the Dee Estuary SPA / Ramsar or of Liverpool Bay SPA were recorded during filed surveys.

Breeding Birds

6.4.19 Breeding bird surveys were undertaken between March and June 2020 (**Appendix 6.1**). Thirteen notable breeding species were recorded onsite, consisting of five species (mallard *Anas platyrhynchos*, stock dove *Columba oenas*, dunnock *Prunella modularis*, willow warbler *Phylloscopus trochilus* and meadow pipit *Anthus pratensis*) listed as Amber and five species (skylark *Alauda arvensis*, starling *Sturnus vulgaris*, mistle thrush *Turdus viscivorus*, song thrush *Turdus philomelos* and house sparrow *Passer domesticus*) listed as Red within the *Birds of Conservation Concern 4* and nine species (Mallard, coot *Fulica atra*, goldcrest *Regulus regulus*, skylark, song thrush, mistle thrush, house sparrow, meadow pipit and greenfinch *Chloris chloris*) listed as Amber and three species (willow warbler, whitethroat and starling) listed as Red within the *Birds of Conservation Concern Wales 3*. Of these, five are also S7 species listed as

¹¹ MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. (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

priority species on the Environment (Wales) Act 2016 (skylark, starling, song thrush, dunnock and house sparrow). The number of breeding territories of these species were typically low (≤ 3 territories), although dunnock (21 territories) and song thrush (7 territories) were exceptions (both being associated with mature hedgerows and woodland habitats on Site). The majority of species were recorded along field boundary vegetation especially hedges, tree-lines & woodland habitats.

6.4.20 Ground-nesting species, skylark and meadow pipit, were present in low numbers (3 and 1 territories, respectively). Barn owl *Tyto alba* and tawny owl *Strix aluco* were also noted during great crested newt surveys, barn owl was recorded on one occasion (heard to the north of the Site) and a resident pair of tawny owls were heard on regular occasions within the main woodland block on Site.

6.4.21 The results show that the Site supports a breeding bird assemblage typical of a farmland site, but does not support notable numbers of ground nesting bird species.

Bats

6.4.22 The Cofnod data search returned 331 records of nine species of identified bats including records for noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus* and an unidentified *Myotis* bat within 20m of the Site. Species recorded within 5km of the Site included: Lesser horseshoe *Rhinolophus hipposideros*, noctule, serotine *Eptesicus serotinus*, common pipistrelle, soprano pipistrelle, whiskered *Myotis mystacinus*, Daubenton's *M. daubentonii*, Natterer's *M. nattereri* and brown long-eared bat *Plectoyis auratis*.

6.4.23 Several mature trees are present within the Site, of which most were pedunculate oak. Many of these were assessed as having bat roost potential during the Extended Phase 1 habitat survey, and the woodlands may also contain trees with roost potential.

6.4.24 Records of lesser horseshoe bats occur to the south of the A55 and Site, and the road may potentially provide a dispersal barrier to any nearby populations. There are no cow-grazed pastures located within the Site; this is a favoured habitat for foraging lesser horseshoe bats, therefore the Site is unlikely to provide an important foraging resource for lesser horseshoe bat populations within the wider environment.

Hazel Dormice

6.4.25 The data search returned nine records of hazel dormouse *Muscardinus avellanarius* (most recently from 2013), of which three records were within 2km of the Site and two (dating from 2005) were from within the Site boundaries.

6.4.26 Several dormouse nesting tubes were found within the main woodland in the centre of the Site during the Extended Phase 1 habitat survey. These woodlands contained a small proportion of hazel within the species mix along with some bramble ground flora, providing some potentially suitable habitat for hazel dormouse (if still present).

Otter and Water Voles

6.4.27 The data search provided 15 records of otter *Lutra lutra* within 2km of the Site. The closest record was of an adult male hit by traffic on the A525 road in 2001, some 75m north east of the Site boundary.

6.4.28 Cofnod also provided three records of water vole *Arvicola amphibius* within 2km of the Site with the closest record located in the south west corner of St Asaph Business Park approximately 770m to south of the Site, but separated from it by the A55.

6.4.29 Otter and water vole surveys were carried out in May 2020; with a second water vole survey undertaken in September 2020 (see **Appendix 6.2**). Several flowing watercourses are present within and adjacent to the Site and in the vicinity of the proposed grid connection corridor that may provide suitable habitat for these species. A number of the ditches around the Site, while wet in winter, were observed from subsequent surveys to dry out in spring, providing low suitability habitat conditions for these species.

6.4.30 No evidence of the presence of otter was recorded.

6.4.31 No definitive evidence to confirm the presence of water voles (i.e droppings/latrines) was found. A number of burrows were recorded indicative of small mammal presence, however no other corroborative evidence of water vole was seen, such as feeding remains and 'lawns'. All signs were recorded along the watercourse D4 flowing northwards along the western boundary of the site shown on **Figure 6.6**.

Amphibians

6.4.32 A total of 150 records of great crested newt *Triturus cristatus* were returned from the data search within 2km of the Site, including a single record from the Site itself (From 2008 in Pond **P2**, as shown on **Figure 6.7**). Numerous other recent records refer to further ponds within St Asaph Business Park. These records reflect the importance of the local area as a stronghold for the species and the presence of specific habitats set aside and managed for great crested newts.

6.4.33 Records of common toad *Bufo bufo*, common frog *Rana temporaria*, smooth newt *Lissotriton vulgaris* and palmate newt *Lissotriton helveticus* were also received from the data search.

6.4.34 Pond habitat suitability assessments were carried out in November 2019 and great crested newt presence/absence/population surveys were undertaken in May and June 2020 (see **Appendix 6.3**) at ponds on Site. This species is known to be locally present, and the pond network around St Asaph Business Park south of the intervening A55 road supports a significant population.

6.4.35 The surveys confirmed great crested newt presence in four ponds, and the Site is assessed as supporting a low population of great crested newts, using the pond network for breeding and foraging, and terrestrial habitat for foraging, refuge, hibernation and dispersal. In line with responses from Natural Resources

Wales, this terrestrial habitat is likely to include arable and pastoral grassland fields as well as boundary hedgerows, areas of scrub, field margins and woodland.

Reptiles

6.4.36 A number of records of common reptiles species were returned, including six records of common lizard *Zootoca vivipara*, and thirteen records of slow worm *Anguis fragilis* located within St Asaph churchyard, approximately 700m from the Site. There are seven records of grass snake *Natrix helvetica*, with the closest records at St Asaph Business Park approximately 115m from the indicative grid connection route corridor. It is considered that the woodland edge, field margins, ponds and areas of tall ruderal habitat within the Site provide potentially suitable habitat (albeit limited in extent) for common and widespread reptile species.

Badgers

6.4.37 A preliminary badger survey was undertaken in November 2019 as part of the Extended Phase 1 habitat survey and updated in May 2020. The findings of the survey are provided separately in the Confidential Badger Report (**Appendix 6.4**).

Other Notable Species

6.4.38 No evidence of other protected or notable species was observed during the survey; however the data search identified a range of invertebrates which may utilise the Site or surrounding area, including priority species listed in Section 7 of the Environment (Wales) Act 2016 and Local Biodiversity Action Plan species of butterfly and moth including purple hairstreak *Neozephyrus quercus* and shaded broad-bar *Scotopteryx chenopodiata* (**Appendix 6.6**).

6.4.39 Other protected or notable species considered likely to be present in the local area include hedgehog *Erinaceus europaeus* and brown hare *Lepus europaeus*.

Valuation of Ecological features

6.4.40 The desk study and habitat and species surveys have identified ecological features which have been assigned a value in the context of the Site and the Proposed Development, based on the assessment criteria set out in Section 6.2. Ecological features have been assigned a level of importance/valuation in **Table 6.8**, based on the evaluation criteria and are described in **Table 6.2**.

Table 6.8: Valuation of Ecological Features

Ecological feature	Valuation (scale of importance in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
Statutory designated sites	National	<p>Several nationally and internationally designated sites lie within 5km and 10km respectively.</p> <p>Included in the assessment</p>
Non-statutory designated sites	County	<p>7 Local Wildlife Sites lie within 2km of the Development Site boundaries, the closest of which is Clwyd Estuary and Adjacent fields LWS which lies approximately 485m north of the proposed development.</p> <p>Included in the assessment</p>
General habitats	Local	<p>Habitats within the Site are common and widespread locally and regionally, comprising primarily arable and grazed grassland. The Proposed Development will remove a proportion of habitat to built development and alter arable land to create other habitats, mainly extensive areas of grassland but also including species-rich meadow, new hedgerows and ponds.</p> <p>Priority habitats are present on Site and locally however no priority habitat is lost to development and there would be no fragmentation or isolation of priority habitat.</p> <p>A minimal amount of bramble scrub clearance and surface vegetation clearance/levelling (within a small section of broadleaved semi-natural woodland) will be required to facilitate a proposed footpath route.</p> <p>Included in the assessment due to potential effects on protected or notable species that may utilise such habitats.</p>
Birds	Local	<p>The Site supports a bird assemblage typical of a farmland setting, including species of</p>

Ecological feature	Valuation (scale of importance in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
		<p>conservation value. There is potential for destruction of nests or disturbance to breeding birds depending of timing of the construction phase.</p> <p>There is potential for displacement of wintering bird species including those associated with designated sites, however surveys completed in winter 2019/2020 found no evidence of usage by waterbird species. As such the Site (and surrounding land) does not provide an important foraging or roosting resource (functionally linked land) for species associated with any internationally designated sites (SPA and Ramsar) or associated SSSIs.</p> <p>Included in the assessment.</p>
Bats	Local	<p>The Site provides foraging and commuting opportunities along boundary hedgerows and woodlands. Open arable fields provide very low suitability for foraging/commuting bats. Sheep-grazed grassland may be used for foraging by certain bat species such as noctules (and possibly lesser horseshoe bats).</p> <p>A number of trees have moderate-high bat roosting potential within the Site but all are to be retained and protected as part of the Proposed Development.</p> <p>Included in the assessment.</p>
Hazel dormouse	County	<p>Three records of hazel dormouse (albeit most recently from 2013) within 2km of the Site and two (dating from 2005) from within the Site boundaries. Hedgerows and woodland habitat around the Site provide potentially suitable habitat for this species.</p> <p>Arable and grazed grassland, which forms the majority of the Site, is unsuitable for dormice.</p>

Ecological feature	Valuation (scale of importance in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
		Included in the assessment.
Otter	Local	<p>Otters are recorded in the wider area but no records from within the Site. Watercourses and suitable terrestrial habitat for holts/resting up areas are present on Site but are avoided by the layout design, with the exception of the proposed refurbishment of two existing watercourse crossings required for access. No otter holts or resting up areas were found during survey.</p> <p>Included in the assessment.</p>
Water vole	Local	<p>The closest record for this species relates to the south west corner of St Asaph Business Park approximately 770m south of the Site, but separated from it by intervening built development, including the A55 road.</p> <p>Ditches and watercourses are present within and immediately adjacent to the Site, but only one ditch (D4) remains wet during the spring and summer. All other on-Site ditches are only intermittently wet, limiting their value to water voles. No evidence of water vole was found during survey. The refurbishment of two existing watercourse crossings are required.</p> <p>Included in the assessment.</p>
Amphibians	County	<p>Numerous records of great crested newt, including a single record from the Site itself (Pond P2, in 2008) and for ponds within 250m of the Site (P9, P11 and P12) as well as several records from within Prince's Gorse woodland to the south west. Numerous records for ponds within St Asaph Business Park (within 250m of the proposed cable route corridor but separated from the main Site by the intervening A55 road).</p>

Ecological feature	Valuation (scale of importance in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
		<p>The dominant habitat within the Site (arable, grazed grassland) is generally considered to be of low suitability as amphibian terrestrial habitat however in this area, the agricultural landscape is considered by NRW to be the predominant habitat for the species. Field boundary features such as hedgerows and woodlands provide more favourable and connected habitats.</p> <p>Included in the assessment.</p>
Reptiles	Local	<p>There is very limited high value reptile habitat present. Hedgerow bases and woodlands bordering the Site are considered suitable for reptiles (if present) however arable and intensively grazed grassland provides very limited suitability for reptile foraging or shelter.</p> <p>The Site is considered to be of low importance to local reptile populations, and the proposed development will not isolate, fragment or cause the loss of areas of high value reptile habitat</p> <p>Considered in relation to mitigation measures only.</p>
Badger	Local	Included in the assessment.

Ecological feature	Valuation (scale of importance in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
Other Notable Species including invertebrates	Site/Local	<p>Habitats present are considered suitable to support other notable species including hedgehog and brown hare; however due to the preponderance of managed agricultural land they are unlikely to be dependent on the Site at a population level with similar habitats present in the wider area. Individual animals may occasionally be present and potentially affected during construction.</p> <p>The data search identified a range of invertebrate records within 2km of the Site, some of which may be present on Site or in the surrounding area, including priority species listed in Section 7 of the Environment (Wales) Act 2016 and Local Biodiversity Action Plan species. The Site is unlikely to support large or important invertebrate assemblages, lacking diverse arable field margins, with limited habitat diversity and subject to regular agricultural management and chemical applications. Grassland, trees, scrub, ditches and hedgerows will support a suite of species characteristic of farmland and woodland habitats.</p> <p>Common assemblages of invertebrates typical of farmland habitats are unlikely to be dependent on the Site at a population level with similar and higher value habitats present in the wider area.</p> <p>Considered in relation to mitigation measures only.</p>
Invasive Non-native species	Site	<p>No invasive species were recorded within the Application Site boundaries during survey, or returned from desk study.</p> <p>Not considered within the assessment but precautionary biosecurity measures to be set in place during construction.</p>

6.5 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

6.5.1 Potential effects on ecological features (those scoped in to the detailed assessment as detailed in **Table 6.8**) have been considered. Effects are initially assessed in the absence of mitigation, with residual effects presented thereafter. The assessment is based upon the Proposed Development as shown in **Figure 4.1**.

Construction

6.5.2 Potential construction phase ecological effects associated with the Proposed Development are considered to relate to:

- Direct land take (habitat loss) to accommodate the Proposed Development;
- Temporary disturbance and land take for the Temporary Compounds at the access points and Temporary Access Track (land restored thereafter);
- Disturbance to, fragmentation or severance of connecting habitat or potential commuting routes within and adjacent to the Application Site;
- Disturbance and pollution (indirect effects such as noise and vibration, dust, pollution from surface water run-off) resulting from site clearance and construction, plant and vehicles movements and site workers' activities

Statutory and Non-Statutory Designated Sites

6.5.3 There will be no construction works outside the redline boundary and no direct effects on habitats or species within statutory designated sites, the nearest of which is Elwy Woods SSSI/SAC and Coedydd ac Ogofau Elwy a Meirchion SSSI, approximately 1.79km south of the Site. The distance of these and other designated sites from the Proposed Development, with substantial intervening built development, together with the absence of functionally linked habitat within the Site means that there is no pathway for direct or indirect effects.

6.5.4 In its consultation response (letter dated 11.03.2020), Natural Resources Wales stated:

“From the information provided we consider that the proposed development is unlikely to have a significant environmental effect with respect to Internationally designated sites, European protected sites and Sites of Special Scientific Interest (SSSIs).”

6.5.5 Effects on statutory designated sites from land take, habitat loss or disturbance during construction are assessed to be negligible and not significant.

Habitats

6.5.6 Construction of a solar farm generally requires very low levels of direct and permanent land take (typically less than 5% footprint on the ground). The

BRE guidance¹² states that, as panels are raised above the ground on posts, over 95% of a site used for solar farm development is still accessible for plant growth and complementary agricultural activities, such as conservation grazing.

6.5.7 The Proposed Development will result in primarily arable land and species-poor heavily grazed improved grassland along with small areas of scattered scrub assessed as being of low ecological value (Site value) within the footprint of the construction areas. Priority habitats lie within the Site boundary and the layout of the Proposed Development has been designed to avoid these more valuable features; hence they will experience minimal direct impacts. The layout design restricts disturbance and land take impacts during construction almost entirely to arable, and improved grassland habitats, which are widespread and commonly occurring habitats.

6.5.8 A minor (approximately 79m) PRoW diversion will pass through an area of relatively open canopied broadleaved semi-natural woodland in the south of the Site (see the proposed route in Photo 25: Appendix 6.5). This route will utilise a naturally occurring existing area of species-poor semi-improved grassland present within the woodland belt and involved very minimal surface vegetation clearance in places, where required; thereby avoiding impacts on existing trees and tree root systems.

6.5.9 A small area (approximately 5m wide) of scrub clearance will also be required in the north-west of the Site to facilitate the same PRoW diversion mentioned in the above paragraph (see the proposed route in Photo 26: Appendix 6.5). This consists of an area dominated by bramble, which is periodically cleared by the district network operator (DNO) to facilitate the maintenance of overhead lines.

6.5.10 A 303m stretch of provisionally proposed PRoW diversion through a belt of plantation woodland located in the south-east of the Site has been rerouted along existing farmland field margins in order to avoid any foreseeable impacts to the habitat.

6.5.11 The majority of other habitats present in and around the Site, namely trees, woodland, hedgerows and watercourses, are also avoided by the layout design, and will be retained and protected during construction in line with BS 5837:2012 Trees in relation to design, demolition and construction. These habitats, which also provide connectivity in the landscape, will therefore experience negligible effects.

6.5.12 Construction-related disturbance will be temporary and short term in nature lasting approximately six months.

6.5.13 The ecological effects from the construction phase are therefore restricted to the direct disturbance of and loss of open farmland (arable and semi-improved pasture) habitats.

6.5.14 Retained habitats on Site, and off-site habitats, will experience negligible effects with the implementation of standard good practice runoff

¹² <https://www.bre.co.uk/filelibrary/pdf/Brochures/NSC-Biodiversity-Guidance.pdf>

control and pollution prevention measures as part of a Construction Environmental Management Plan, forming part of the embedded design of the proposed development.

6.5.15 Overall effects from construction on habitats direct and indirect habitat loss, or disturbance leading to habitat degradation) are assessed as minor adverse, temporary and not significant

Fauna

Birds

6.5.16 The Site provides suitable breeding and foraging value (all through the year) for a typical farmland bird assemblage but does not support significant numbers of notable overwintering bird species, such as waders.

6.5.17 Potential effects on birds during construction relate to the temporary loss of nesting (but only if construction takes place during the breeding season) or foraging habitat, directly within the Site, or indirectly within adjacent areas through disturbance or displacement. Barn owls *Tyto alba* are likely to be present in the area (see **Appendix 6.1**) and may forage in field margins across the Site. No suitable nesting locations were recorded within the Site and therefore no potential barn owl nest sites will be affected by the development.

6.5.18 Hedgerows and trees located along field boundaries (which will be retained and protected as part of the Proposed Development) support a range of typical farmland nesting bird species; these habitats will likely be subject to some level of localised indirect disturbance or displacement for a temporary period during the construction period.

6.5.19 Local bird populations will be expected to have become tolerant to existing background activity and disturbance from normal farm operations and local infrastructure (road etc.). Construction disturbance will be short term and confined to within the Site, and the layout design includes suitable protection buffers around woodland, hedgerows and ditches which serve to separate potentially disturbing activities from locations most likely to be used by birds for foraging, shelter or breeding.

6.5.20 A minor (approximately 79m) PRoW diversion will pass through an area of relatively open canopied broadleaved semi-natural woodland in the south of the Site. This route will utilise a naturally occurring existing area of species-poor semi-improved grassland present within the woodland belt lacking in a suitable understorey required to sustain a diverse range of nesting bird species and involved very minimal surface vegetation clearance and avoid impacts on existing trees.

6.5.21 A small area (approximately 5m wide) of scrub clearance will also be required in the north-west of the Site to facilitate the PRoW diversion. This consists of an area dominated by bramble, which is periodically cleared by the DNO to facilitate the maintenance of overhead lines. The clearance of such a small area of habitat is considered unlikely to impact the assemblage of nesting birds, hence will have a negligible effect on local populations within the Site boundaries.

6.5.22 Ground nesting species such as skylark, and foraging wintering birds may be temporarily displaced from active construction areas within the Site, depending on the time of year that construction works are undertaken. Areas of suitable foraging and nesting habitat will however remain available both in the wider area and on-unworked parts of the Site.

6.5.23 The effects of temporary disturbance, habitat loss and displacement on local bird populations during construction are considered to be minor adverse and short term and not significant in the context of the availability of similar arable and grassland habitat locally.

Bats

Foraging and commuting

6.5.24 Construction-related effects on bats are likely to involve the loss of low value foraging habitat (primarily arable and semi-improved grassland). More valuable foraging areas around ponds, along ditch and watercourse riparian corridors, hedgerows or woodland edges will be retained and remain available during the construction phase. And hence will not result in the direct loss or severance of potential foraging habitats and/or commuting routes around the Site. The value of these habitats for bat species has been identified as a moderate value for foraging and commuting species and the layout design includes buffer areas to safeguard them from direct and indirect effects during construction.

6.5.25 Construction activities will take place during the daytime, hence foraging/commuting habitat will remain available to bat species present and utilising such features. There is an abundance of similar habitats in the wider agricultural landscape.

6.5.26 Very localised disturbance to and loss of moderate value foraging habitat (short sections of hedgerow and strips of field margin), will have no measurable effect on connectivity or wider availability of foraging resources and is assessed to be of negligible magnitude on a feature of Local importance, with negligible effects on connectivity or wider availability of foraging resources on local bat populations, which is not significant.

6.5.27 Bats (roosting, foraging and commuting) may be affected through the use of temporary lighting of the construction site and adjoining habitats if works extend after dark. However, construction will take place during daylight and trees and hedgerows are not anticipated to be illuminated after dark. Any short term lighting used during construction will be highly localised in small areas of the Application Site at any one time, and designed to minimise additional light spill. Measures will be included in the CEMP to ensure a suitable buffer is maintained away from the nearby LWS and SSSI to avoid any risk of indirect disturbance to these habitats which may be used by bats. As a result, the potential effects of lighting on bats during the construction phase are considered to be temporary and of negligible on a feature of Local importance and therefore not significant.

Roosting

6.5.28 Trees within the Site were assessed for their bat roost potential, and found to be generally semi-mature to mature in age, with a number of scattered trees considered to have low-moderate bat roosting potential. There are no buildings/structures present. Trees will be protected and retained with suitable buffers in line with BS 5837:2012 *Trees in relation to design, demolition and construction* and as a result, the risk of direct disturbance/impact to an active bat roost during construction is considered to be negligible and subsequently not significant.

6.5.29 Overall, effects on bats/local bat populations from construction are considered minor adverse and temporary and therefore not significant.

Hazel Dormice

6.5.30 With local and on-Site records of this species from previous years, it is considered possible that dormice may be present in suitable woodland and mature hedgerow habitat around the Site. The extent of suitable habitat for this species is restricted to boundary hedgerows and pockets of woodland; features which will not be affected by construction and will be retained and protected during works with suitable exclusion buffers, as described under Habitats. Open arable, and grassland fields, which form the majority of the Proposed Development area, are unsuitable for dormice, especially as they are subject to regular agricultural management and disturbance.

6.5.31 Suitable habitat is also present in the wider area, with connectivity along the hedgerow network to more extensive woodlands with favourable foraging and nesting opportunities. These off-site habitats and the connectivity provided by the networks of hedgerows will be unaffected by the Proposed Development.

6.5.32 A small area (approximately 5m wide) of scrub clearance will be required to facilitate the PRow diversion; the area is periodically cleared by the DNO to facilitate the maintenance of overhead lines and hence unlikely to support hazel dormice on a long-term basis. The clearance of such a small area of habitat is considered unlikely to impact the species, and will have a negligible effect on local populations within the Site boundaries (if present).

6.5.33 Given the retention and protection of the majority of habitats with potential to support dormice (if present), the construction phase is considered to have negligible magnitude impact on a receptor of County value in relation to this Site and hence a negligible effect on local populations of this species, which is not significant.

Otter and Water Voles

6.5.34 Watercourses and ditches were surveyed as part of the otter and water vole survey (see **Appendix 6.2**) and found to be largely dry by spring. The only watercourse to remain wet was D4 along the western boundary of the Site. No confirmed water vole or otter presence was identified from survey, however ditch D4 provides suitable habitat. Other ditches are less suitable, being seasonally dry and having limited foraging resources.

6.5.35 Two existing ditch crossings will require refurbishment for access routes, affecting dry ditches with limited suitability for otter or water vole. This will require culvert replacement and works along a short section of bank (approximately 5m).

6.5.36 Apart from these two limited working areas, all other watercourses/ditches within the Site will be retained and protected with minimum 5m buffers from banksides during construction to protect bankside and aquatic habitats. No direct habitat loss or disturbance will occur as a result. Standard site runoff and pollution prevention measures will be set in place as part of the embedded design, ensuring that indirect effects on water quality and associated habitat with potential to be used by water voles and otter (including downstream of the Site) are avoided. With buffers and protective measures adopted as part of the design, there will also be no severance of potential foraging/commuting routes along watercourses and ditches.

6.5.37 Otters may move away from watercourses to forage and rest up, for example to nearby ponds and woodlands. During the construction phase, movement across the Site to and from such features may be temporarily disrupted; however such works are short term and concentrated in the open arable and grassland habitats, with habitat connectivity along hedgerows and ditches maintained. As a result, this is not considered to adversely affect movement, foraging or refuge opportunities for any otters that may pass through the Site as part of a wider territory.

6.5.38 Potential effects on water voles and otter (if present) from construction are considered negligible, short term and temporary and not significant.

Amphibians

6.5.39 Great crested newts (GCN) are confirmed as present within ponds on-Site and in the surrounding area as detailed in **Appendix 6.3**. This protected species is therefore also likely to be present in surrounding terrestrial habitats, including on arable and grassland within the Site which is generally of relatively low suitability as amphibian habitat, with field boundary features such as hedgerows, and woodland providing more opportunities for foraging, dispersal and overwintering. However this area is considered to be a stronghold for the species, and during consultations, Natural Resources Wales confirmed that it considers the agricultural landscape to form the "*predominant habitat*" for this species (Scoping Opinion Response dated 14/05/2020).

6.5.40 All on-site ponds will be retained within the proposed layout design, with these and all nearby off-site waterbodies protected during construction (see Mitigation **Section 6.5**).

6.5.41 Construction phase effects (in the absence of suitable mitigation measures) may occur as a result of inadvertent killing or injury to individual GCN if present in terrestrial habitat within the working zone, primarily arable and grassland fields. The construction works will be temporary and time-limited over a period of six months with foraging, refuge and dispersal opportunities across the Site reinstated and enhanced thereafter (see Mitigation). Higher value habitat (hedgerow bases, scrub, woodland etc.) is retained and protected with

buffer zones throughout the construction phase, maintaining foraging, refuge and connectivity around the Site.

6.5.42 Although extensive in area, habitat loss or disturbance during the construction phase affecting individual animals or the favourable conservation status of the local GCN population (an ecological receptor of High value) is considered to result in temporary, short term, reversible and **moderate adverse** effects on foraging and dispersal opportunities and risks harm to individual animals if present in working areas. This is assessed as **significant** in the absence of mitigation measures. Measures to mitigate effects on great crested newts will therefore be required to protect individual animals and to maintain the favourable conservation status of local populations.

6.5.43 No long term habitat severance or fragmentation effects will occur to adversely affect the favourable conservation status of local GCN populations.

Reptiles

6.5.44 The arable and grassland fields within the Site offer very limited opportunities for reptile species and the Site lacks extensive areas of high value reptile habitat overall. However, features such as ponds, hedgerows and field margins, ditches and woodland provide more suitable areas for dispersal, foraging and refuge, and these will be retained and protected as part of the Proposed Development. Potential effects on reptiles during construction are therefore limited to inadvertent harm or disturbance to individual animals potentially present during initial vegetation and ground clearance. Such effects are assessed to be minor adverse on local reptile populations and not significant.

Badgers

6.5.45 The potential for badgers to be present and affected by the Proposed Development is discussed separately in the Confidential Badger Report.

Grid Connection Route

6.5.46 The proposed indicative grid connection route corridor will run largely along roads and verges and will entail temporary and short term disruption to habitats and localised disturbance associated with the excavation of a narrow trench line approximately 1.5m wide, cable laying and reinstatement of the ground immediately thereafter. A temporary layout area is also required for materials and plant. The potential ecological effects of the cable connection would therefore be limited to the construction phase.

6.5.47 Construction phase effects (in the absence of suitable mitigation measures) may occur as a result of temporary habitat loss or due to inadvertent killing or injury to protected or notable species present within the construction zone. Habitats likely to be affected are common and widespread and considered to be of value at a site geographic scale only, with the majority of the route likely to utilise land of negligible value (hardstanding, road verge, amenity grassland, recently disturbed ground). Species present along or adjacent to the proposed cable route may be temporarily displaced or experience direct or indirect disturbance. Habitat effects are assessed to be minor adverse at worst and not significant, given that a large proportion of the route will likely be across

hardstanding or in verges comprising roadside amenity grassland, with a very small area of low value habitat affected for a short period of time only.

6.5.48 Given the short duration of works in any section along the proposed route, disturbance effects on nearby habitats and associated species are similarly considered to be negligible adverse and not significant with standard good practice construction, pollution prevention and runoff control measures in place.

Amphibians

6.5.49 The proximity of terrestrial and aquatic habitat supporting great crested newts (especially in the vicinity of St Asaph Business Park) is noted and, while the proposed grid connection is not considered likely to have any effects on the favourable conservation status of local populations of this species, there is a risk to individual animals if present within the construction zone. Given the scale and nature of the works, extending along a narrow corridor and largely alongside hardstanding or roadway, the risk to any individuals present is likely to be low and would be reduced further through appropriate timing of works when the species is less likely to be present within or around the working areas. No ponds will be directly affected by the proposed cable route, and the alignment will be designed to avoid these features. Waterbodies in the vicinity will be protected with the implementation of standard pollution prevention and control measures, thereby safeguarding habitat potentially used by amphibians.

6.5.50 Effects on great crested newts are considered on a precautionary basis to be moderate adverse and significant, therefore requiring specific mitigation to ensure legislative compliance and the protection of individuals.

6.5.51 Nesting birds could be temporarily displaced by construction if this takes place during the breeding season period (generally March-August inclusive), however much of the habitat adjoining the proposed cable route is of relatively low value, comprising hardstanding or areas already subject to human disturbance. No effects would occur outside of the breeding season, and within this period the extent of disturbance is considered to be low and not significant, limited in extent and duration to habitat features immediately adjacent or directly affected.

6.5.52 It is considered unlikely that badgers would establish setts adjacent to the road verge itself but may be present in the local area. The possible presence of this mobile species in the vicinity of future works cannot be discounted, however the magnitude of effects are assessed to be minor at worst and not significant, and can be readily addressed through pre-commencement survey and suitable avoidance and mitigation if necessary.

6.5.53 No trees would be lost during the construction phase. Effects on roosting or commuting bats are assessed to be negligible and not significant.

Operation

6.5.54 This section assesses operational effects during the lifetime of the solar farm following the completion of construction. Once operational, solar farms operate with little intervention or disturbance required, limited to occasional

maintenance visits and ongoing management of grassland and other habitats around the Site, including grazing and hedgerow cutting. Over time, dirt and dust can accumulate on the glass surface of the modules, reducing its power output. Periodic cleaning of PV modules where required will be require only soft brushes and soft, clean water. No chemicals are required for the cleaning process. The ecological impacts of periodic PV cleaning or other maintenance visits are considered to be negligible and not significant and likely to be less disruptive than ongoing normal farming operations.

6.5.55 There are no significant additional operational effects relating to land take, habitat loss or disturbance other than those already addressed under Construction. Some ground disturbance affecting the created operation-phase grassland areas may result from periodic repairs or maintenance such as retrenching of underground cables or restringing of arrays, however these will be temporary in nature and will include reinstating soils and re-seeding with a suitable grass and wildflower mix in accordance with the Landscape Proposals Plan. Such short term and temporary disturbance is assessed to be negligible and not significant.

Statutory and Non-Statutory Designated Sites

6.5.56 There will be no operational effects on statutory or non-statutory designated sites over and above those described under Construction.

Habitats

6.5.57 There will be no operational effects on habitats over and above those described in the Construction effects section above. Habitats within the Site will be enhanced in accordance to the methods detailed within the Landscape Proposals Plan and Biodiversity Management Plan. Overall the proposals will enhance habitats on Site and their value to a range of species including invertebrates, birds, amphibians and small mammals.

6.5.58 Habitats created and strengthened as part of the Landscape Proposal Plan (part of the embedded design of the Proposed Development) will result in a **medium positive** effect on local habitat diversity and therefore a **significant** biodiversity benefit at a Local/Site scale, contributing to resilience and strengthening ecological networks in line with national planning policy.

Birds

6.5.59 Once constructed, the Site will be fenced and there will be negligible noise or lighting associated with the Proposed Development. There is likely to be less overall human activity and disturbance than is associated with current normal farming practices, to which local bird populations have already become relatively tolerant. Periodic cleaning and maintenance of PV modules will take place outside of the nesting bird season (generally March-August inclusive), where practicable.

6.5.60 There would be no additional habitat loss (and hence loss of potential breeding areas) over and above that assessed under Construction. The landscape planting included in the design for the Proposed Development includes the creation of habitats favourable to bird foraging and breeding.

6.5.61 Breeding bird surveys undertaken in 2020 recorded a relatively low assemblage of breeding bird species in habitats surrounding the proposed minor (approximately 79m) PRow diversion through an area of broadleaved semi-natural woodland, and found evidence to suggest that this area of woodland only supports a single breeding priority species, namely; dunnock. This is a regularly occurring species which is a relatively common garden nesting bird species and as such can become habituated to regular human presence. Additionally, the area of woodland in question is located in close proximity to Gwernigrion Farmhouse, and existing farm track and directly adjacent to an existing substation; it is therefore considered that nesting bird species (and other species utilising these woodland habitats) are familiar and habituated to regular human activities in the area. It is therefore not considered likely that the proposed PRow diversion will lead to the long-term displacement of nesting bird species.

6.5.62 The loss of open farm fields may potentially deter some ground nesting bird species, however it has been noted in the literature¹³ that ground nesting species may potentially nest between rows of panels. In the published 'The Effects of solar Farms on Local Biodiversity: A Comparative Study' (Montag et al. 2016)¹⁴ investigated whether solar farms can lead to greater ecological diversity when compared with equivalent undeveloped sites. To assess changes in biodiversity relating to the solar farms, wildlife in the solar farm to wildlife at a "control" plot nearby was compared accordingly. The control plot was outside the solar array, but within the same farm.

6.5.63 The study revealed that overall, both a higher diversity and abundance of birds of conservation concern utilise solar arrays when compared with control plots, thereby indicating that solar farms may be able to provide an important resource for declining species such as skylark. Within this study the difference in numbers of skylarks within solar plots and control plots was found to be not significant. This indicates that skylarks will likely utilise the habitats within the proposed solar development footprint within their territorial boundaries. Recent studies conducted by the RSPB and outlined in their conservation blog¹⁵ further support high bird usage of solar farms by farmland bird species, including skylark.

6.5.64 As a result, operational effects of the Proposed Development on birds once new planting and habitat creation has established are assessed to result in a minor positive effect at a Site/Local level, which is beneficial but not significant in terms of the assessment criteria.

Bats

6.5.65 There would be no additional habitat loss over and above that assessed under Construction. No habitat fragmentation will occur and no permanent lighting of the solar farm will be required, thereby retaining dark corridors for commuting and foraging bats. There will be no effects on roosting bats, with no

¹³ https://www.rspb.org.uk/Images/Solar_power_briefing_tcm9-273329.pdf

¹⁴ <http://www.solar-trade.org.uk/wp-content/uploads/2016/04/The-effects-of-solar-farms-on-local-biodiversitystudy.pdf>

¹⁵ <https://community.rspb.org.uk/ourwork/b/biodiversity/posts/bird-use-on-solar-farms-final-results>

tree removal required and no new illumination of trees and woodland areas with potential to support bat roosts.

6.5.66 Newly created grassland and waterbodies, planted trees and hedgerows which form part of the design for the Proposed Development, and is provided in the Landscape Proposal Plan, will provide enhanced opportunities for foraging and commuting bat species once established.

6.5.67 Natural England Guidance TIN101 states that there is some evidence from a laboratory-based study that bats may occasionally collide with solar panels; however there is no evidence to date substantiating any associated collision risk. The panels to be used for the Proposed Development will have a matt metal frame which breaks up the surface visual effect and it is considered that there is negligible potential for effects on local bat populations.

6.5.68 As a result, operational effects of the Proposed Development on bats once new planting and habitat creation has established are assessed to result in a minor positive effect at a Site/Local level, which is beneficial but not significant in terms of the assessment criteria.

Badger

6.5.69 The operational phase will have no effects on badgers over and above that assessed under Construction. Badgers will be able to move around and fully utilise land underneath the panel array and no permanent lighting of the facility will be required.

6.5.70 Newly created grassland and waterbodies, planted trees and hedgerows, which form part of the design for the Proposed Development, will provide enhanced and relatively undisturbed habitat for badgers to utilise for foraging and shelter. Free movement for badgers (and other small mammals) into and out of the Site will be maintained via gaps or badger gates positioned at suitable intervals at the base of the perimeter fencing.

6.5.71 As a result, operational effects of the Proposed Development on badgers are assessed to result in a minor positive effect at a Site/Local level, which is beneficial but not significant in terms of the assessment criteria.

Otter and Water vole

6.5.72 There would be no additional habitat loss over and above that assessed under Construction, with ditches and watercourses unaffected by the operation of the solar farm and protected through a surface water runoff management system (SUDS). No habitat fragmentation will occur and no permanent lighting of the facility will be required, thereby retaining dark corridors along watercourses for the species (if present in the future).

6.5.73 As a result, operational effects of the Proposed Development on otter and water vole are assessed to be negligible and not significant.

Hazel Dormouse

6.5.74 There would be no additional habitat loss over and above that assessed under Construction. Additionally, newly created hedgerow will provide strengthened habitat connectivity, foraging and refuge opportunities for hazel dormouse (if present in the future) once established.

6.5.75 Operational effects of the Proposed Development on hazel dormouse are assessed to result in a minor positive effect at a Site/Local level, which is beneficial but not significant in terms of the assessment criteria.

Reptiles

6.5.76 There would be no additional habitat loss over and above that assessed under Construction. Additionally, newly created hedgerow, wetland and grassland habitat will provide strengthened habitat connectivity, foraging and refuge opportunities for reptiles.

6.5.77 Operational effects of the Proposed Development on reptiles are assessed to result in a minor positive effect at a Site/Local level, which is beneficial but not significant in terms of the assessment criteria.

Amphibians

6.5.78 During the operational phase there would be no additional habitat loss over and above that assessed and discussed under Construction. There will also be no habitat loss or disturbance affecting on neighbouring habitats and any amphibian populations they may support. There will be no operational effects on off-site ponds in the wider area.

6.5.79 New grassland, wetland and hedgerows created in line with the Landscape Proposals Plan will provide enhanced habitats which will be suitable for great crested newts and other amphibian species. Habitats on Site will maintain areas suitable for great crested newts breeding, foraging, overwintering and dispersal.

6.5.80 As a result, operational effects of the Proposed Development on amphibians once new planting and habitat creation has established are assessed to result in a minor positive effect which is beneficial but not significant in terms of the assessment criteria. Such beneficial effects will however ensure the continued favourable conservation status of the local populations of great crested newts within and around the Site.

Grid Connection Route

6.5.81 Once trenching and cable laying works are complete and the surfaces reinstated, there would be no operational phase effects on ecological receptors.

Decommissioning

6.5.82 Site baseline conditions are likely to change significantly over the likely 40 years of operation, and prediction of these conditions at this point is considered unreliable in terms of predicting likely future decommissioning effects on biodiversity. However potential impacts from decommissioning are considered to be similar to those already described in relation to the construction phase,

namely direct and indirect disturbance, temporary/permanent habitat loss and vegetation removal. Update ecological surveys will therefore be necessary prior to decommissioning in order to record the presence of protected and notable species and habitats and identify potential effects and any necessary protection and mitigation measures in order to comply with planning policy and wildlife legislation applicable at the time.

6.6 MITIGATION AND ENHANCEMENT

Mitigation by Design

6.6.1 The design of the Proposed Development includes a range of inherent elements which avoid or reduce the potential for adverse ecological impacts, including siting the solar array layout within lower value habitats (arable and semi-improved pasture) and avoiding higher value features such as ponds, hedgerows and woodlands included as part of the iterative design process. The potential for adverse effects during the construction phase will also be controlled through standard good construction and environmental working practices as an integral part of the proposal, as outlined in the relevant topic chapters.

6.6.2 Biodiversity protection measures included as part of the design comprise in summary the following elements:

- Avoiding higher value habitats and retention of such habitats where they occur on-site, such as woodland, hedgerows, ponds and trees;
- Retaining and protecting on-site ponds to maintain aquatic habitat for amphibians, specifically great crested newts;
- Maintaining suitable exclusion buffers around streams/ditches, woodland, hedgerows, trees and ponds – all habitats likely to be most valuable to protected and notable species;
- Hedgerows and trees will be retained and protected during construction and operation in-line with BS 5837:2012 *Trees in relation to design, demolition and construction*; and
- The operational facility will not be lit (apart from emergency lighting associated with the battery storage facility) to avoid illuminating flightlines and foraging areas used by bats, in particular watercourse and ditch corridors, woodland edges and the hedgerow network. The lighting design (operational phase) will be in line with Bat Conservation Trust/Institute of Lighting Professionals guidance¹⁶.

6.6.3 Habitat protection buffers will be maintained throughout the construction phase and will be implemented as part of a CEMP, and identified with appropriate fencing and signage along with site team briefings at 'tool box talks'.

6.6.4 No works will be permitted within the habitat protection buffers unless suitably guided by a method statement and under the supervision of the Ecological Clerk of Works (ECOW). No lighting of the construction or operational

¹⁶ Guidance Note 8: *Bats and artificial lighting*. Bats and the Built Environment Series ILP 2018. <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/>

site is proposed, however if needed for a specific task, no illumination will be permitted to be directed towards boundary woodlands, designated sites or along hedgerows which may be used by foraging or commuting bats.

6.6.5 The suitably qualified and experienced Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction and future decommissioning activities and through whom appropriate ecological advice will be provided throughout. The ECoW will be responsible for undertaking and/or co-ordinating checks for protected species before construction and decommissioning activities commence. The ECoW (or appointed 'clerk' on behalf of the ECoW) will also maintain a watching brief as necessary throughout the construction and any future decommissioning phase to ensure compliance with relevant legislation

Additional Mitigation

6.6.6 Moderate adverse effects (during the construction phase only) have been identified in relation to great crested newts, potentially affecting foraging and dispersal opportunities and presenting the risk of harm to individual animals if present in working areas. This is assessed as significant in the absence of mitigation measures. Measures to mitigate effects on great crested newts will therefore be required to protect individual animals and to maintain the favourable conservation status of local populations. No adverse effects are assessed to arise from the operational phase, with habitat creation and management proposed as part of the design that will deliver positive effects at a local scale and enhance terrestrial and aquatic habitats for this species.

6.6.7 Mitigation measures have been identified to protect great crested newts during the construction phase, and provide compensatory terrestrial and aquatic habitat to benefit the local population over the long term and help ensure the continued favourable conservation status of the species. These will be provided for via detailed Reasonable Avoidance Measures (RAMs) within a CEMP, and/or a European Protected Species Mitigation Licence from Natural Resources Wales. Such measures will include:

- A detailed Method Statement to protect animals during the construction works which will be a contractual part of the CEMP;
- Supervision and advice of an appropriately experienced and licensed ecologist;
- New habitat creation including ponds, grassland, scrub and hedgerow planting, managed to maintain favourable conditions for great crested newt foraging and strengthened connectivity for dispersal;
- Creation of artificial hibernaculae for overwintering; and,
- Monitoring and aftercare.

6.6.8 A possible effect of construction is the displacement (albeit temporary) of foraging and nesting birds, if works are undertaken in the breeding season. In order to avoid impacts on nesting birds and to ensure compliance with the provisions of the Wildlife and Countryside Act 1981 (as amended), it is recommended that construction and any associated vegetation removal takes place outside of the bird breeding season (March-August inclusive). If vegetation

works are necessary during the breeding season any suitable nesting habitat to be affected by works will be checked by a suitably experienced ecologist prior to works commencing. Works would be permitted to proceed only when the ecologist is satisfied that no offence will occur under the legislation.

6.6.9 Two existing ditch crossings require refurbishment to accommodate access tracks. Further otter and water vole surveys will be undertaken up and down stream of the proposed areas of work in the appropriate season to check for evidence of presence of either species, ahead of any planned construction. Should signs of otter or water vole presence be confirmed, works in or adjacent to the ditches will only proceed under suitable mitigation measures as advised by the project ecologist and, if necessary under a European Protected Species Mitigation Licence issued by Natural Resources Wales.

6.6.10 The minor scrub clearance works required for PRoW provision (and any associated minor access purposes/grid connection works); the implementation of a series of RAMs will be sufficient to avoid impacts on individual hazel dormice. The RAMs will include a tool box talk and Ecological Clerk of Works (ECoW) watching brief if suitable habitat is to be affected (e.g. cutting back scrub or creating short breaks). The adoption of the RAMs Method Statement (provided in Appendix 6.7) will ensure that the favourable conservation status of the local hazel dormice population (if present) will be maintained.

6.6.11 To avoid the risk of inadvertent disturbance or harm to individual reptiles present during the construction phase, a series of RAMs will be set in place as part of the CEMP, including measures such as phased vegetation management under the advice of an Ecological Clerk of Works to encourage animals to move away from active working areas and 'tool box talks' to inform site staff on necessary precautions such as the maintenance of buffers around higher value habitats.

6.6.12 Badgers are a highly mobile species and may establish new territories and construct new setts on Site in the intervening period between the planning process and any consented future development. As a precaution to avoid adversely affecting any setts created on or adjacent to the Site, a pre-construction badger survey will be undertaken by a suitably experienced ecologist to inform any additional mitigation measures that may be necessary, including amending the layout or applying to undertake works with a badger licence from Natural Resources Wales.

6.6.13 Landscape proposals for the Proposed Development have been designed to provide an overall biodiversity gain; in line with BS 42020 - *A Code of Practice for Biodiversity in Planning and Development*. Landscape proposals ensure that there is no net loss of habitats of ecological value and all habitat loss will be mitigated for appropriately.

6.6.14 All habitat enhancement measures and ongoing habitat management to maintain their biodiversity value will be informed by and implemented through a Biodiversity Management plan (BMP) which will cover both construction and operation phase activities.

6.6.15 Proposed habitat enhancement measures include:

- Approximately 1728m of native species rich hedgerow planting and infilling to strengthen existing and gappy hedgerows;
- 81.62ha of floristically enhanced grassland (potentially low-intensity grazing pasture) within the proposed solar panel compartments
- species-rich tussocky grassland comprising of 17.44ha, designed as great crested newt terrestrial habitat enhancement, located around the Site in large areas of grassland and fields margins surrounding the solar compartment fence-lines;
- Attenuation storage and hydraulic control areas seeded with wetland meadow seed mixes;
- creation of seven wildlife ponds located within the proposed extensive areas of species-rich tussocky grassland and the re-profiling of two existing ponds, designed as great crested newt aquatic habitat enhancement; and
- Controlling run-off during construction and operation of the Proposed Development in line with legislative requirements and current good practice guidance to prevent possible indirect pollution effects on habitats (including waterbodies) and associated species;

6.6.16 The landscape planting as shown in **Figure 5.11** and habitat creation shown in **Figure 6.8**, along with subsequent management designed to maintain and encourage biodiversity across the Site throughout the lifetime of the solar farm, will create greater structural and species diversity than is currently provided, and will provide favourable habitat conditions for a range of species, including amphibians, small mammals and invertebrates.

6.6.17 Further information regarding biodiversity enhancement measures is provided in **Appendix 6.7**.

6.6.18 It is considered that the proposed habitat mitigation and enhancements will maintain areas suitable for great crested newts breeding, foraging, overwintering and dispersal in accordance with the terms of any Mitigation Strategy and European Protected Species Licence and as set out in the Biodiversity Management Plan (**Appendix 6.7**) and the CEMP.

6.6.19 **Table 6.8** summarises how mitigation measures will be delivered as part of the planning process.

Table 6.8: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
1	Avoidance and protection of higher value habitats within and around the Site	X		
2	New habitat enhancements /compensation as set out in the Landscape Plan and Biodiversity	X		X

	Management Plan.			
3	Pre-construction surveys for protected species and to inform additional avoidance or mitigation requirements during the construction phase			X
4	Biodiversity protection measures (construction phase) to be included in the CEMP	X		X
5	Appointment of Project Ecologist/ECoW	X		X
6	Great crested newt mitigation measures, including confirmation of European Protected Species Mitigation licence (post-consent) granted by NRW before works commence			X

Grid Connection Route

6.6.20 As part of the embedded mitigation for the proposed cable route, the detailed alignment will be designed to minimise effects on habitats, utilising roadways, amenity grassland and hardstanding areas where practicable. Trees and hedgerows will be protected during works in line with BS 5837:2012 *Trees in relation to design, demolition and construction*.

6.6.21 Standard pollution prevention and control measures will protect nearby water bodies and ditches and associated downstream habitat and species associated with them.

6.6.22 The working corridor will be clearly marked and construction plant and vehicles will remain within this area, to minimise disturbance to adjoining habitats and species.

6.6.23 Natural habitats disturbed during construction will be reinstated on completion of works as part of the CEMP, including re-seeding with species mixes appropriate to the locality.

6.6.24 As a part of standard good construction practice, Reasonable Avoidance Measures (RAMS) will be employed during construction to prevent wildlife such as badgers entering the working area and potentially becoming trapped in excavations.

6.6.25 Specific mitigation will be employed to protect great crested newts and ensure the continued favourable conservation status of the local population. This may take the form of a detailed Reasonable Avoidance Measures Method Statement and supervision by a licensed ecologist during works, or potentially, under a European Protected Species Mitigation Licence from Natural Resources Wales, also supported by a detailed Method Statement.

Residual Effects

6.6.26 With the above measures in place, there will be no significant adverse residual effects on any ecological features as a result of the Proposed Development. All residual effects are limited to minor or negligible adverse, with minor positive effects arising from the operational phase.

6.6.27 In relation to great crested newts, it is considered that the embedded design features and proposed mitigation is readily achievable and can be implemented to ensure the protection of this species. With mitigation in place, construction phase residual effects on great crested newts are assessed as negligible and not significant, with minor positive operational phase effects, beneficial to the local population but not significant in terms of the assessment criteria.

Enhancements

6.6.28 All biodiversity enhancements will be in accordance the Biodiversity Management Plan (**Appendix 6.7**).

6.6.29 Hedgerow planting (approximately 1728m in total) will be carried out as part of the proposed development which will include strengthening gappy sections of hedgerow with native species and planting new hedgerows. This will provide more species diverse and well-structured hedgerows, of value for wildlife around the Site.

6.6.30 The main body of the Site is currently arable and pastoral farmland; this area will be used for the solar panel installation and a more botanically diverse grassland sward (81.62ha in total) will be encouraged to develop a more floristically enhanced grassland (potentially low-intensity grazing pasture) within the proposed solar panel compartments.

6.6.31 Two areas of attenuation storage and hydraulic control are proposed in the centre and southern areas of the Site, as shown in the *Elwy Solar Energy Site Layout Plan*. These areas, subject to periodic flooding will be seeded with an appropriate floodplain and water meadows seed mix containing species suitable for seasonally wet soils and is based on the vegetation of traditional floodplain and water meadows.

6.6.32 Additional wildlife boxes will be installed within suitable habitats throughout the Site, these consist of:

- a minimum of fifteen bird boxes erected on mature trees located within the fields, woodlands and hedgerows within the Site;
- dormouse nesting provision will be provided through the provision of a minimum of fifteen dormouse nest boxes within existing semi-natural woodland habitats within the Site; and
- bat roost provision will be made through the inclusion of a minimum of fifteen bat roost boxes on mature trees located within the fields, woodlands and hedgerows.

6.6.33 Extensive areas of species-rich tussocky grassland totalling approximately 17.44ha, will be created as great crested newt terrestrial habitat

enhancements in large areas of grassland fields margins and smaller 4m wide strips of grassland surrounding the solar compartment fence-lines. These areas will be sown with a suitable species-rich tussock grassland seed mix of regional provenance,

6.6.34 Seven new ponds are proposed within the Site; designed as great crested newt aquatic habitat enhancement, all ponds will be surrounded by extensive areas of grassland habitats and to maximise habitat connectivity to existing and newly created aquatic and terrestrial habitats throughout the Site. The locations of the proposed ponds are provided in **Figure 6.8**.

6.6.35 As additional great crested newt habitat enhancements of existing ponds within the Site, pond P7 will be deepened and re-profiled to encourage the retention of water to the benefit of local amphibian/aquatic invertebrate populations. Pond P1 will also be re-profiled, removing excessive willow scrub vegetation, and pond margins will be opened up.

6.6.36 Fourteen hibernacula will be created within the species-rich tussocky grassland in relatively close proximity to newly created pond habitats. The design of the hibernacula will follow that set out in the Great Crested Newt Mitigation Guidelines (English Nature 2001). Each individual hibernaculum will consist of mainly inert rubble material and wooden logs, covered with soil and/or turf (sourced from pond excavations) and will be at least circa 1 x 2 metres in diameter. The hibernacula will provide additional terrestrial habitats for foraging and hibernating great crested newts (and other amphibians and reptile species), and will also encourage a more diverse invertebrate population within the grassland habitats.

6.7 CUMULATIVE AND IN-COMBINATION EFFECTS

6.7.1 Total land take for solar farm developments is typically low (less than 5% footprint on the ground), construction works are low impact with groundworks for a temporary period of time, much of which will be undertaken on land subject to annual minor excavation and regular disturbance through tilling/ploughing and normal agricultural management practices.

6.7.2 The Proposed Development is located in a rural area with few other developments likely to have any discernible cumulative or in-combination effects.

6.7.3 Potential cumulative effects on local GCN populations due to land take for other developments in the area could potentially fragment dispersal networks or cause cumulative loss of foraging and breeding/overwintering habitat. However effects on GCN populations due to proposed development are likely during the construction phase only, with positive effects throughout the operation phase as a result of proposed habitat enhancements, hence there is no potential for medium or long-term cumulative adverse effects to the on-site and wider GCN population and the positive effect of operational phase habitat measures on Site potentially avoids any such cumulative risks from occurring.

6.7.4 As a result, no cumulative or in-combination effects are anticipated in relation to the Proposed Development.

6.8 SUMMARY

Introduction

6.8.1 An Ecological Impact Assessment has been undertaken to enable the determination of the likely ecological effects of the Proposed Development.

6.8.2 The assessment establishes the likely presence of protected or notable species, identifies statutory designated sites for nature conservation in the vicinity of the Proposed Development, and evaluates the overall conservation status of the Application Site. The potential effects on identified ecological features including designated sites and protected and notable species is assessed in line with current guidance, and appropriate mitigation and enhancement measures are described.

Baseline Conditions

6.8.3 The Application Site is located on farmland consisting of intensively managed arable and sheep grazed pastoral fields. Two large areas of semi-natural and plantation broadleaved woodland are present in the western section of the Site and two smaller areas of woodland are also located within the Site boundaries. A number of scattered isolated mature trees are scattered throughout the fields. The Site supports a number of ponds, and a small stream flows along the Site's south-western boundary, bordered by a narrow belt of semi-natural broadleaved woodland. Two areas of semi-natural broadleaved woodland are located within the Site, dominated by sycamore, pedunculate oak, blackthorn and goat willow with a smaller percentage of hazel.

6.8.4 The majority of field boundaries comprise barbed wire fences, however several field boundaries are formed by species poor hedgerows, predominantly hawthorn, with occasional elder and beech. None of the hedgerows present are considered to qualify (in ecological terms) as 'important' under the Hedgerow Regulations (1997). In the wider context the Site is surrounded by further arable farmland and scattered pockets of deciduous woodland with a network of hedgerows, ponds and ditches present.

6.8.5 The proposed grid connection route corridor runs south of the Site's southern boundary, and crosses the A55 before connecting to the National Grid substation and compound at St Asaph.

6.8.6 The Site is not located within any statutory designated site for nature conservation but several protected sites lie in the wider area, the nearest of which are Rhuddlan Pond Local Nature Reserve some 1.17km to the north and Coedwigoedd Dyffryn Elwy / Elwy Valley Woods Special Area of Conservation (SAC) and Coedydd ac Ogofau Elwy A Meirchion Site of Special Scientific Interest (SSSI) approximately 1.79km south. The Liverpool Bay Special Protection Area (SPA) for birds is located almost 6km north of the Site. Several non-statutory designated sites lie within 2km of the Site, including Coed Cord / Coed y Saeson Local Wildlife Site (LWS), and ancient woodland site approximately 125m to the south. Several other internationally designated sites lie within 10km of the Site.

6.8.7 Wintering bird surveys undertaken during 2019-2020 indicated that the Site is not important to or relied upon by waterbird species, which have the

potential to be affected by the construction and operation of a solar park. The surveys also did not record qualifying bird species of the Dee Estuary SPA/Ramsar or Liverpool Bay SPA using the Site or immediately surrounding fields.

6.8.8 Breeding bird surveys completed in 2020 recorded ten notable species using the Site; including mallard, stock dove, dunnock, willow warbler and meadow pipit and five Red List species (skylark, starling, mistle thrush, song thrush and house sparrow). Of these, skylark, starling, song thrush, dunnock and house sparrow five are also S7 species listed as priority species on the Environment (Wales) Act 2016. The majority of breeding species were recorded along field boundary vegetation especially hedges, tree-lines & woodland habitats. The Site supported a breeding bird assemblage typical of a farmland site, but did not support notable numbers of ground nesting bird species. Ground-nesting species, skylark and meadow pipit, were present in low numbers (3 and 1 territories, respectively).

6.8.9 Local records showed a range of bat species present within 2km of the Site including lesser horseshoe bats to the south of the Site on the other side of the A55. A number of trees within the Site were assessed as having bat roost potential, including scattered mature oaks and within woodland.

6.8.10 Hazel dormice had also been recorded in 2005 within the Site boundaries (likely associated with woodland and mature hedgerows) as arable and grassland habitat is unsuitable for this species..

6.8.11 Otter and water vole have been recorded in the wider area however no evidence confirming otter or water vole presence within the Site was recorded from survey.

6.8.12 Along with other amphibian species, great crested newts are present in the local area, and this part of North Wales is considered to be a stronghold for the species. Presence/absence and population surveys in 2020 confirmed that the Site supported a low population of great crested newts, using the pond network for breeding and foraging, and terrestrial habitat for foraging, refuge, hibernation and dispersal. This terrestrial habitat is likely to include arable and pastoral grassland fields as well as boundary hedgerows, areas of scrub, field margins and woodland.

6.8.13 Common reptiles species have been confirmed in the local area from desk study, including common lizard and slow worm, located within St Asaph churchyard, approximately 700m from the Site. Records of grass snake were also provided from St Asaph Business Park, south of the A55. It is considered that the woodland edge, field margins, ponds and areas of tall ruderal habitat within the Site provide potentially suitable habitat (albeit limited in extent) for common and widespread reptile species.

6.8.14 A badger survey was undertaken in November 2019 and updated in May 2020. The findings of the survey are provided separately in a Confidential Badger Report.

6.8.15 No evidence of other protected or notable species was observed during the survey; however the data search identified a range of invertebrates which

may utilise the Site or surrounding area, including priority species listed in Section 7 of the Environment (Wales) Act 2016 and Local Biodiversity Action Plan species of butterfly and moth including purple hairstreak and shaded broad-bar. Also considered likely to be present in the local area are hedgehog and brown hare.

Likely Significant Effects

6.8.16 The assessment concluded that there was the potential for significant adverse effects on great crested newts, during the construction phase only. Specific mitigation measures have been identified as a result.

6.8.17 No other significant adverse effects were identified on statutory or non-statutory designed sites or habitats, or on protected or notable species, including bats, birds, or other species in relation to the Proposed Development, or in combination with other proposed developments in the wider landscape.

6.8.18 Other short term, temporary, and/or not significant effects identified through the assessment have also been addressed as part of the iterative design process or standard good practice construction and site management measures.

Mitigation and Enhancement

6.8.19 The design of the Proposed Development included a range of inherent elements which avoided or reduced the potential for adverse ecological impacts, including siting the solar array layout within lower value habitats (arable and semi-improved pasture) and avoiding higher value features such as ponds, hedgerows and woodlands included as part of the iterative design process. The potential for adverse effects during the construction phase will also be controlled through standard good construction and environmental working practices.

6.8.20 Biodiversity protection measures have been included as part of the design, such as:

- Avoiding higher value habitats and retention of such habitats where they occur on-site, such as woodland, hedgerows, ponds and trees;
- Retaining and protecting on-site ponds to maintain aquatic habitat for amphibians, specifically great crested newts;
- Maintaining suitable exclusion buffers around streams/ditches, woodland, hedgerows, trees and ponds – all habitats likely to be most valuable to protected and notable species;
- Hedgerows and trees will be retained and protected during construction and operation in-line with BS 5837:2012 Trees in relation to design, demolition and construction; and
- Avoiding light spill (the operational facility will not be lit) to protect dark corridors for wildlife and flightlines and foraging areas used by bats, in particular watercourses and ditches, woodland edges and the hedgerow network.

6.8.21 Habitat protection buffers will be maintained throughout the construction phase and will be implemented as part of a Construction Environmental Management Plan (CEMP). A suitably qualified and experienced

Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction and future decommissioning activities to supervise and provide ecological advice at appropriate stages.

6.8.22 Specific mitigation measures will be set in place in relation to great crested newts, the only ecological receptor considered at risk of experiencing significant adverse effects (during the construction phase). These include a series of avoidance and protection measures to be included in the CEMP, a detailed Method Statement to be delivered via Reasonable Avoidance Measures and/or a European Protected Species Mitigation Licence from Natural Resources Wales.

6.8.23 Additional measures have been identified to ensure legislative compliance and the protection of wildlife, including pre-commencement/construction surveys for species such as badger, otter and water vole, along with nesting bird checks should initial vegetation removal be required during the bird breeding season. Should evidence of such species be confirmed, works posing a potential risk to them will only be permitted to proceed under suitable mitigation measures, as advised by the project ecologist/ECoW and, if necessary under a European Protected Species Mitigation Licence issued by Natural Resources Wales.

6.8.24 Landscape proposals for the Proposed Development have been designed to provide an overall biodiversity gain; in line with BS 42020 - A Code of Practice for Biodiversity in Planning and Development. Landscape proposals ensure that there is no net loss of habitats of ecological value and all habitat loss will be mitigated for appropriately.

6.8.25 All habitat enhancement measures and ongoing habitat management to maintain their biodiversity value will be informed by and implemented through a Biodiversity Management plan (BMP) which will cover both construction and operation phase activities.

Conclusion

6.8.26 With embedded design measures and mitigation in place as described, the Proposed Development will not result in any significant adverse effects on any habitats or species, or on statutory and non-statutory designated sites. Minor (but not significant) positive effects are anticipated in relation to foraging, commuting, roosting and breeding bats and birds as well as for badgers, hazel dormice and reptiles, if present, as a result of habitat creation and diversification.

6.8.27 Specific mitigation to safeguard the favourable conservation status of the great crested newt population, including construction under a European Protected Species mitigation Licence granted by Natural Resources Wales

6.8.28 **Table 6.9** provides a summary of effects, mitigation and residual effects.

Table 6.9: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Construction								
Designated sites	Habitat loss/damage. Disturbance to habitats & species	Indirect, temporary, short term	High	Negligible	International-County	Not significant	No specific mitigation required Standard pollution prevention and control measures	Not significant
On Site habitats	Habitat loss/damage. Disturbance	Direct, permanent and temporary, reversible	Low	Low	Site/Local	Not significant	Habitat mitigation and enhancement provided as part of the Landscape Proposals Plan and Biodiversity Management Plan Standard pollution prevention and control measures	Not significant
Off-site habitats	Habitat loss/damage. Disturbance	Indirect, short term, temporary,	Low/Medium	Low	Site/Local	Not significant	No specific mitigation required	Not significant

ENVIRONMENTAL STATEMENT

Summary

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
		reversible					Standard pollution prevention and control measures	
Birds	Loss or disturbance to breeding, foraging or wintering habitat	Direct, temporary, short term	Low	Low	Site/Local	Not significant	No specific mitigation required, but beneficial measures include habitat and enhancement as part of the Landscape Proposals Plan, additional bird box provision and Biodiversity Management Plan	Not significant
Bats	Disturbance to foraging areas	Indirect, short term, temporary, reversible	Medium	Negligible	Site/Local	Not significant	No specific mitigation required, habitat reinstatement as part of construction works completion	Not significant
Bats	Loss of or	Direct and	Medium	Negligible	Site/Local	Not	No specific	Not

ENVIRONMENTAL STATEMENT

Summary

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
	disturbance to roosts	indirect, short term, temporary.				significant	mitigation required, but beneficial measures include habitat and enhancement as part of the Landscape Proposals Plan, additional bat box provision and Biodiversity Management Plan	significant
Hazel dormice	Habitat loss/damage Disturbance of individuals	Direct, short term, temporary	Medium	Negligible	Site	Not significant	No specific mitigation required, but beneficial measures include habitat and enhancement as part of the Landscape Proposals Plan, additional and Biodiversity Management Plan	Not significant
Otter and	Habitat	Direct, short	Medium	Negligible	Site	Not	No specific	Not

ENVIRONMENTAL STATEMENT

Summary

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Water Vole	loss/damage Disturbance of individuals	term, temporary				significant	mitigation required. Standard pollution prevention and control measures	significant
Great crested newts	Habitat loss, disturbance, direct harm to individuals	Direct and indirect, short term, temporary	High	Moderate	County	Significant	Mitigation Strategy, working Method Statement and construction under Reasonable Avoidance Measures and/or a European Protected Species Mitigation Licence from NRW. Habitat creation and enhancements.	Not significant
Reptiles	Habitat loss/damage Disturbance of individuals	Direct, short term, temporary	Low	Low	Site	Not significant	No specific mitigation required, but beneficial measures include habitat	Not significant

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Summary

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
							and enhancement as part of the Landscape Proposals Plan, additional and Biodiversity Management Plan	
Operation								
Designated sites	Habitat loss/damage. Disturbance to habitats & species	Indirect	High	None				
Habitats	Aquatic and terrestrial habitat creation and diversity through landscape planting and ongoing management	Direct, long term for lifetime of development	Low	Moderate positive	Local/Site	Not significant	New habitat creation and diversification, strengthened connectivity and habitat networks	Not significant
Great crested newts	Increased provision of aquatic and terrestrial habitat for	indirect, permanent/lo ng term	High	Minor positive	County	Significant	New habitat and hibernaculae creation, strengthened connectivity set	Significant (positive)

ENVIRONMENTAL STATEMENT

Summary

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
	breeding, foraging and refuge including overwintering						aside habitat for GCN in line with Biodiversity Management Plan and Landscape Plan, and in accordance with any requirements set out in a possible European protected Species Mitigation Licence.	
Other species (including birds, bats, otter and water voles, reptiles, brown hare etc.)	Minor disturbance for routine maintenance activities	Indirect short term, intermittent	Low	Negligible	Local/Site	Not Significant	Site will be subject to reduced disturbance compared to normal farming practices. New bird and bat box provision and habitat management will benefit species.	Not Significant

ENVIRONMENTAL STATEMENT

Summary

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
							Dark corridors will be maintained to accommodate commuting and foraging bats, badgers and other species. Dispersal routes into and out of site maintained via gaps under perimeter fenceline.	
Cumulative and In-combination								
No cumulative effects are anticipated.								