

5 ECOLOGY

- 5.1 This assessment was prepared by Colin Hicks BSc (Hons), a Member of the Chartered Institute of Ecology and Environmental Management with 22 years' experience as a professional ecologist.
- 5.2 This chapter of the Environmental Statement assesses the likely significant effects on the environment from the construction, operation and decommissioning of Rush Wall Solar Park as described in Chapter 2 on the following environmental receptors and/or resources:
- Designated nature conservation sites
 - Notable habitats
 - Notable species

SYNOPSIS

- 5.3 The construction phase of solar park would have no significant adverse effects on valued ecological receptors as the majority of the habitats supporting these features will be retained in an undeveloped buffer zone outside the equipment footprint. This includes interest features of Local, National and International nature conservation sites, habitats such as hedgerows and reens, bats, amphibians, water voles, and aquatic plants and invertebrates.
- 5.4 The operation of the solar park will have a minor, long-term positive effect on a range of valued ecological receptors. This will be through retaining the undeveloped buffer zone along site boundaries, reduced management pressures on land that is currently an intensively managed grassland habitat, and the creation of an additional 33ha of grassland habitats on land that is currently in arable rotation.
- 5.5 Receptor specific enhancement detailed within the Landscape and Ecology Management Plan (Appendix 2.3) includes bat roosting and bird nesting boxes, removal of shading vegetation along ditches, creation of habitat for Shril Carder Bee and management of buffer zone grassland for biodiversity.
- 5.6 Cumulative impacts were considered for a diverse range of planning applications provided by Newport City Council and Monmouthshire County Council. It is concluded that cumulative impacts are unlikely.

METHODOLOGY

Scoping and consultation

- 5.7 Scoping direction was sought from Planning Inspectorate Wales on the information to be included in the Environmental Statement (ES). The assessment methodology is set out at Appendix 3.1 Scoping Report. The Planning Inspectorate responded through the publication of a Scoping Direction which can be found at Appendix 3.2. The EIA Scoping Report set out the intended scope of the EIA for consultation with PINS Wales as follows:
- Topics to be covered in the ES;
 - Identified constraints;
 - Comments on the methodology proposed (including bodies to consult); and
 - Cumulative developments identified.
- 5.8 The process of scoping assists in defining the key topic areas and information to be included in the ES, and can identify where matters could be scoped out of further assessment, if there are no likely significant environmental effects.
- 5.9 Before adopting a scoping direction, PINS Wales consulted the following consultees in relation to Ecology:
- Newport City Council;
 - Natural Resources Wales.
- 5.10 In addition, the following bodies were consulted during the EIA process:
- RSPB;
 - Gwent Wildlife Trust;
 - Gwent Bat Group;
 - Gwent Ornithological Society;
 - Newport Council Natural Environment Team;
 - Natural Resources Wales; amphibian and ornithology leads

Table 5-1 Consultation Summary

Consultee, date and format of consultation (written, meeting/s, discussions, site visit)	Details (e.g. request to include more views, include a new receptor)	Action taken in this assessment and signposting.
Newport City Council (NCC) Scoping Opinion 18 January 2019	Survey effort within NCC scoping opinion aligned with the EIA scoping report provided by the developer. NCC did however raise concerns in relation to shading or restriction on reed maintenance.	A site visit was completed with NCC on 14/02/2020 to discuss any potential ecological issues onsite. Issues relating to reed maintenance were taken into account during design stage.
	Protected species such as otters will also need to be considered since they are known to use reeds.	Otters are included in this assessment.
	Impacts during development, de-commissioning and the operational phase should be addressed	These have been addressed within this ES.
	Surveys should be undertaken in accordance with best practice effort, by a suitably qualified ecologist and details of survey effort should be agreed with relevant authorities.	Surveys have been completed in line with best practice. Unfortunately, NRW have not been able to provide consultation on this project, other than at the scoping stage.
	Cumulative impact of the proposal will be considered as part of the Environmental Statement. Whilst this is positive, the Council considers that the cumulative assessment should not be limited to only solar development and that scope should include other developments in the locality.	NCC and Monmouthshire County Council have provided a detailed list of schemes to be taken into account during the cumulative impact assessment and they are included within this ES.
Natural Resources Wales (NRW) Scoping opinion 18 January 2019	The project site lies within the Gwent Levels – Redwick and Llandeenny SSSI. The SSSI is notified for its range of aquatic plants and invertebrates associated with the reeds and ditches of the drainage system. The ES should assess what impacts the project will have on the SSSI qualifying features during all stages of the project and include suitable avoidance or mitigation measures, as necessary	Gwent Levels – Redwick and Llandeenny SSSI is included in this ES.

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Consultee, date and format of consultation (written, meeting/s, discussions, site visit)	Details (e.g. request to include more views, include a new receptor)	Action taken in this assessment and signposting.
	<p>We recommend the ES surveys the habitat on site, including the flora of the watercourses and assess whether the ditches are shaded or whether they are open to sunlight. Suitable mitigation or management should be proposed in the ES where relevant.</p>	<p>This has been completed within mitigation and management included in detailed within the LEMP (Appendix 2.3).</p>
	<p>The ES should consider the long-term management and maintenance of the ditches. Good practice is for there to be no fencing of the ditches or reens as this would make it difficult to manage the watercourse and scrub on the banks. We normally recommend development free buffer zones (7 metres from ditches and 12.5m for reens) to be implemented between any structures and the top of the bank.</p>	<p>Ditch management is included with the LEMP (Appendix 2.3). Buffers of 12.5metres to reens and 7 metres to ditches have been designed in.</p>
	<p>If new crossings are proposed consider how they may impact the SSSI. Good practice is to use over span bridges rather than culverts.</p>	<p>No new crossings are proposed</p>
	<p>Alterations to poaching levels from cattle within the SSSI could have an effect on the aquatic invertebrates as lightly poached margins of reens and ditches provide habitat and egg laying sites for aquatic invertebrates. This should be assessed by the ES</p>	<p>This has been addressed within the ES.</p>
	<p>The ES should include an assessment of any impact of underground cables on the qualifying features.</p>	<p>This has been addressed within the ES.</p>
	<p>We recommend an assessment is undertaken on the loss in grassland habitat and flora that supports shrill carder bee which is a qualifying feature SSSI. The ES should propose suitable mitigation measures.</p>	<p>An assessment has been completed and enhancement for Shrill carder Bee is included in the LEMP (Appendix 2.3).</p>
	<p>The ES should consider whether a site management plan is required for construction, operation and de-commission stages, which includes details on who would be responsible for undertaking maintenance of the ditches during the life time of the development</p>	<p>A Landscape and Ecology Management Plan (Appendix 2.3) is provided and includes ditch management.</p>

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Consultee, date and format of consultation (written, meeting/s, discussions, site visit)	Details (e.g. request to include more views, include a new receptor)	Action taken in this assessment and signposting.
	The ES should assess whether any crossings on site will be required, reducing crossing as far as possible.	This has been taken into account at the design stage.
	The ES should include an assessment of any impact of underground cables on the qualifying features.	The cable route is included within this ES.
	A HRA should be undertaken for the potential impacts on the Severn Estuary European site in line with The Conservation of Habitats and Species Regulations 2017. Therefore, the ES should include the following to inform the assessment: - an assessment of potential impacts on the migration of the Common Eel <i>Anguilla anguilla</i> , (a feature of the Severn Estuary Ramsar and SSSI) through the watercourses of the Gwent Levels. During the construction and operation of the site there should be no barriers to the eel migration.	This is included within the ES.
	We're also aware of the presence of dormice in the locality and advise that this species is scoped in to the ES. We advise that the site should be assessed to determine if and to what extent it supports such species	An assessment of the potential for the site to support dormice is included in the preliminary ecological appraisal (Appendix 5.1) in which it was stated: Species rich hedgerows have limited potential for Dormice and will remain intact beyond the solar PV array. No mitigation for Dormice is needed and they can be scoped-out of further consideration.
	Specific surveys should be prepared and undertaken by suitably qualified, experienced and where necessary, licensed surveyors in accordance with published guidance, where this exists, and best practice.	Surveys have been completed in line with best practice.

Table 5-1 Consultation Summary

Consultee, date and format of consultation (written, meeting/s, discussions, site visit)	Details (e.g. request to include more views, include a new receptor)	Action taken in this assessment and signposting.
	Where certain species are notified features of nearby protected sites (SSSI, SAC or SPA) we advise they are considered in the context of being both a notified feature of a site and a legally protected species in their own right.	This process has been adopted within the ES.
	The ES should identify the likely impacts of the proposals on such species and detail mitigation that will be put in place to address each of those impacts, including consideration of the short-term and long-term management of any compensatory habitat and any monitoring that may be required.	This process has been adopted within the ES and detailed within the LEMP (Appendix 2.3) where necessary.
	It should also identify if any protected species licences may be required for the development. In this context we advise that the ES demonstrate how the proposal would satisfy the legal tests which need to be undertaken before NRW can grant an EPS licence as set out in Regulation 55 of the Conservation of Habitats and Species. We consider that where it is relevant, it would be acceptable to present the surveys methodology and results, impacts and mitigation in the form of a licence method statement.	This has been addressed within the LEMP (Appendix 2.3) although a license method statement is not included.
	Regarding the proposed zone of influence for otter, we note the intention to consider the site with a 30m radius. We advise that the potential for habitat capable of supporting natal use for otter is considered. This would likely require consideration of a wider area of potentially 200 metres from the site.	Where suitable natal Otter habitat was present within 100metres, this was included in the Otter survey.
	We recommend the applicant consults local authorities Ecologists on the scope of the work to ensure that regional and local biodiversity issues are adequately considered, particularly those habitats and species listed in the relevant Local Biodiversity Action Plan and are that are considered important for the conservation of biological diversity in Wales.	Newport City Council (MonLife) ecologists have been consulted and attended a site meeting.

Table 5-1 Consultation Summary

Consultee, date and format of consultation (written, meeting/s, discussions, site visit)	Details (e.g. request to include more views, include a new receptor)	Action taken in this assessment and signposting.
	<p>The Applicant should contact other relevant people/organisations for biological information/records relevant to the site and its surrounds. These include the relevant Local Records Centre (SEWBREC) and any local ecological interest groups (for example bat groups, mammal groups)</p>	<p>Requests for biological records have been made to Gwent Wildlife Trust, Gwent Bat Group and South East Wales Biodiversity Records Centre.</p>
	<p>We recommend an assessment is undertaken on the loss in grassland habitat and flora that supports shrill carder bee which is a qualifying feature SSSI. The ES should propose suitable mitigation measures</p>	<p>This process has been adopted within the ES.</p>
	<p>Cumulative effects: the assessment includes the associated Gwent Farmer’s Community Solar Scheme’s land for lapwing mitigation and shrill carder bee mitigation.</p>	<p>This process has been adopted within the ES.</p>
<p>Natural Resources Wales (NRW) Pre-application consultation 08/01/2021. Discussed during DAS meeting 19/03/2021</p>	<p><u>Requirement 1:</u> Ecology and Nature Conservation - Further information is required which demonstrates the proposal has no adverse effects / likely significant effects on the Gwent Levels Site of Special Scientific Interest. Request for revision to ditch management program to enhance the site to meet favourable condition status.</p>	<p>A ditch management plan has been provided along with additional shrill carder bee habitat management within the LEMP.</p>
	<p><u>Requirement 2:</u> Ecology and Nature Conservation - A revised Habitat Regulations Assessment is required with likely significant effects and measures to avoid impacts on the Special Area of Conservation, Special Protection Area and Ramsar features specified within the document.</p>	<p>An updated HRA has been provided.</p>
	<p><u>Requirement 3:</u> European Protected Species - Great Crested Newt Conservation Strategy;</p>	<p>Updated Great Crested Newt mitigation has been provided within the Great Crested Newt survey report (Appendix 5.5).</p>
	<p><u>Requirement 4:</u> European Protected Species - Dormice Survey and/or Dormouse Conservation Strategy;</p>	<p>Dormouse surveys have been completed for both the application site and lapwing mitigation area (Appendix 5.9).</p>

Table 5-1 Consultation Summary

Consultee, date and format of consultation (written, meeting/s, discussions, site visit)	Details (e.g. request to include more views, include a new receptor)	Action taken in this assessment and signposting.
	<u>Requirement 5:</u> European Protected Species - Lighting Plan;	No lighting is proposed for the operation and construction phases of the project. This is clarified within relevant report sections.
	<u>Requirement 6:</u> European Protected Species - Water Vole Conservation Strategy;	Updated Water Vole mitigation has been provided in within the Water Vole survey report (Appendix 5.7).
Newport City Council (MonLife) Site visit 14th February 2020	Site visit completed. Comments from Monlife: The one thing I would like to emphasise is the importance of achieving net benefit through securing restoration and management of retained habitats.	Biodiversity Metric 2.01 applied to proposed mitigation and enhancement. SPIES tool for Solar Park Management ² applied to proposed mitigation and enhancement. Outcomes are reported in LEMP (Appendix 2.3).
NRW – Great Crested Newt lead	Request for discussion/site visit	NRW unable to provide consultation.
Gwent Wildlife Trust Site visit 10th April 2019	Request for records of birds and information on water vole re-introductions/monitoring made 06/02/2020	No response from GWT.
Gwent Wildlife Trust	Request for records.	
South East Wales Biodiversity records Centre	Request for records.	Records provided and included in relevant reports.
Gwent Bat Group	Request for records.	Records are held by South East Wales Biodiversity Records Centre.
Monmouthshire County Council and Newport County Council	Request for list of projects to consider in cumulative impact	List provided.

¹ Ian Crosher A, Susannah Gold B, Max Heaver D, Matt Heydon A, Lauren Moore D, Stephen Panks A, Sarah Scott C, Dave Stone A & Nick White A. 2019. The Biodiversity Metric 2.0: auditing and accounting for biodiversity value. User guide (Beta Version, July 2019). Natural England

² See: <https://www.lancaster.ac.uk/spies/>

Assessment Site and Zone of Influence

- 5.11 The Assessment Site includes all areas within the planning application boundary and any adjacent areas that may be affected by the proposed development.
- 5.12 The Zone of Influence is the area encompassing all predicted negative ecological effects from the proposed development, both those which would occur as a result of land-take and habitat loss, and those which would occur through disturbance, such as noise.
- 5.13 The study area for the biological records search provided by South East Wales Biodiversity Records Centre (SEWBRc) in Cardiff is 2 km radius, centred on assessment site for notable species and 4km for non-statutory nature conservation sites. The data will identify and locate records of species of animals and plants recorded in the search area over the last 50 years and will identify sensitive ecological receptors.
- 5.14 Location of statutory nature conservation sites within 5km was determined from Natural Resources Wales datasets³
- 5.15 The Zone of Influence for ecological receptors during the construction, operation and decommissioning phases is detailed in Table 5.2.

³ <https://lle.gov.wales/catalogue/item/ProtectedSitesSitesOfSpecialScientificInterest/?lang=en>

Table 5-2. Solar farm Zone of Influence on ecological receptors (construction, operation and decommissioning).

Ecological feature	Zone of influence - Construction	Zone of influence - Operation	Zone of influence – Decommissioning
Hedgerows, reedbeds, ponds, eutrophic standing waters, coastal and floodplain grazing march, arable field margins	Site area	Site area	Site area
Shrill Carder Bee <i>Bombus sylvarum</i>	Site area	Site area	Site area
Badgers	Site area plus 30 metre buffer	Site area	Site area plus 30 metre buffer
Breeding birds	Site area plus 100 metre buffer	Site area	Site area plus 100 metre buffer
Winter birds	Site area plus 200 metre buffer	Site area	Site area plus 200 metre buffer
Passage birds	Site area plus 200 metre buffer	Site area	Site area plus 200 metre buffer
Water vole	Site area plus 50 metre buffer	Site area	Site area plus 50 metre buffer
Otter	Site area plus 50 metre buffer (100m where natal habitat present)	Site area	Site area plus 50 metre buffer
Bats	Site area plus 100 metre buffer	Site area	Site area plus 100 metre buffer
Common Dormouse	Site area and lapwing mitigation area	Site area	Site area
Reptiles	Site area plus 30 metre buffer	Site area	Site area plus 30 metre buffer
Amphibians	Site area plus 30 metre buffer	Site area	Site area plus 30 metre buffer
Great Crested Newts	Site area plus 500 metre buffer	Site area	Site area plus 500 metre buffer
Aquatic invertebrates associated with the reed network	Site area plus 30 metre buffer	Site area	Site area plus 30 metre buffer
Aquatic plants associated with the reed network	Site area	Site area	Site area
Terrestrial invertebrates along reed banks and associated with hedgerows	Site area plus 30 metre buffer	Site area	Site area plus 30 metre buffer
Internationally designated sites	5km	5km	5km
Nationally designated sites	5km	5km	5km
Local Sites of importance for nature conservation	1km	1km	1km

Site surveys

Preliminary Ecological Appraisal

- 5.16 A Preliminary Ecological Appraisal was completed by an experienced ecologist and a Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) (Appendix 5.1).
- 5.17 Habitats were classified using the Phase 1 Habitat Survey methodology developed by the Joint Nature Conservation Committee (JNCC, 2010⁴) and modified by the Institute of Environmental Assessment (IEA, 1995⁵). The main plant species were recorded, and broad habitat types mapped. Habitats encountered are described within the Results section, with a map included within the report. Plant species were identified according to Stace (1997⁶).
- 5.18 During this survey, any obvious evidence of protected species was noted, and site habitats were assessed for their potential to support notable or protected species.

Desktop survey

- 5.19 The desktop survey collated existing biological records for the assessment site and adjacent areas and identified any nature conservation sites that may be affected by the proposals. This comprises an important part of the assessment process, providing information on ecological issues that may not be apparent during the site survey. Consultees for the data search included:
- South East Wales Biodiversity Records Centre - records of protected/notable species and non-statutory nature conservation sites within 2km of the assessment site and non-statutory nature conservation sites within 4km of the centre of the assessment site.
 - Natural Resources Wales datasets – location of statutory nature conservation sites within 5km.
- 5.20 Species data was examined for protected and notable species records. An assessment was then made, based on known habitat preferences, as to whether these species might be present within the site and how they might be affected by the proposal.
- 5.21 The location of nature conservation sites was examined to determine their ecological and landscape relationships with the proposed site. An assessment was then made of how the sites may be affected

⁴ Joint Nature Conservation Committee (JNCC), 2010. *Handbook for Phase 1 Habitat Survey - a Technique for Environmental Audit*. Reprinted by JNCC, Peterborough

⁵ Institute of Environmental Assessment (IEA), 1995. *Guidelines for Baseline Ecological Assessment*, Institute of Environmental Assessment. E&FN Spon, an imprint of Chapman and Hall. London.

⁶ Stace, C., 1997. *New Flora of the British Isles*. 2nd edition. Cambridge University Press, Cambridge.

by the proposal, taking into account these relationships, and the species and/or habitat types for which the nature conservation site was chosen.

- 5.22 In compliance with the terms and conditions relating to its commercial use, the full desk study data is not provided.

Aquatic invertebrates and Shrill Carder Bee

- 5.23 An aquatic invertebrate survey (Appendix 5.2) was completed using the standard methodology employed for aquatic invertebrate sampling across the Gwent Levels⁷.
- 5.24 A bumblebee survey was completed targeting Shrill Carder Bee *Bombus sylvarum* and the Brown-banded Carder Bee *Bombus humilis*, both of which are known to have nationally significant populations on the Gwent Levels. A transect which included areas with flowers such as thistles was walked in warm, sunny conditions and any bumblebees recorded.

Bats

- 5.25 Bat activity transects to accepted best practice methodology⁸ were completed each month during the bat active period April to October (Appendix 5.3). Due to the extent of the assessment site, two surveyors were used to walk a northern and southern transect route, each of which was approximately 3.3km in length. Whilst walking the route, the surveyors recorded bat activity in the area using suitable bat detectors. At 10 fixed stations along the route, stops were made of approximately 5 minutes to record activity in locations adjacent to hedgerows, reens and in field centres.
- 5.26 Each month in the bat active period April and October 2019, remote bat detectors were deployed into 4 locations and left to record for 7 nights. Locations were chosen to allow comparison between retained habitats likely to be used by bats (hedgerows and reens) and the solar park footprint where activity is likely to be currently constrained by agricultural management.

Badgers

- 5.27 A walkover survey was completed within the proposed development site and a 30 metre buffer (Appendix 5.4). This was completed during daylight hours. All features resulting from Badger activity, including sett entrances, latrines, foraging scrapes and well-worn pathways, were accurately mapped using a handheld GPS receiver. Where necessary, digital images of features

⁷ A manual for the survey and evaluation of the aquatic plant and invertebrate assemblages of grazing marsh ditch systems Version 6. Downloaded 14/05/2020 from <https://cdn.buglife.org.uk/2019/07/2013Manual.pdf>

⁸ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

were collected, and all entrances were assessed as to their level of use and placed into the following categories:

- Active – Well-worn entrances with evidence of recent badger activity including paw prints, fresh bedding or excavations.
- Occasional use – Entrances open but with small amounts of live vegetation or leaves along tunnel base. Evidence of excavations in last few months with old bedding seeding in spoil heap.
- Abandoned - Partially collapsed entrance or completely filled with leaf litter. Spoil heap reduced by erosion with no pathway leading to the entrance. Includes badger sett entrances that have been adopted by rabbit or fox.
- Status unknown – Tunnels which have firm evidence of badger habitation at some time in the past (either tunnel shape or evidence of seeded bedding/badger hair in spoil) but now appear to be inhabited by rabbits or foxes.

5.28 Dependent on how entrances were clustered and their importance to the local Badger populations they were also classified as part of a:

- Main sett – A large cluster of entrances, continually occupied and used for breeding.
- Annex sett – A smaller cluster, usually occupied and close to the main sett and connected to it by well-worn pathways.
- Subsidiary sett - Seasonally occupied and some distance from the main sett.
- Outlier – small number of entrances, sometimes only one. Used sporadically and no obvious connection to main sett.

Hazel Dormouse surveys

5.29 Following consultations with NRW 150 dormouse survey tubes were installed into hedgerows of the proposed development site between 23rd April and 5th May 2021 (Appendix 5.9).

5.30 75 dormouse survey tubes were installed into hedgerows within, and adjacent to, the breeding lapwing mitigation site on 17th May 2021 (42 tubes) and 3rd June 2021 (additional 33 tubes) (Appendix 5.9).

5.31 Tubes were placed within the hedgerows, between 1 – 2.5 meters in height, with the entrance to the tube facing inwards towards the centre of the hedgerow. Tubes were also placed on near-horizontal branches of woody scrub, and trees within the broad-leaved woodland areas. Each tube was numerically referenced (the number written on the backend of each tube) with a permanent marker.

5.32 Nest-tubes were placed in the hedgerows and inspected for the presence of dormice or dormouse nesting material by a licensed dormouse ecologist, for the duration of June to early November 2021.

Amphibians, including Great Crested Newt

- 5.33 An assessment for the potential for the assessment site to support common and widespread amphibians (Common Toad, Common Frog, Palmate Newt and Smooth Newt) was made during the preliminary ecological appraisal (Appendix 5.5).
- 5.34 All accessible waterbodies within 100 metres of the assessment site were evaluated for their potential to support Great Crested Newt by calculating a habitat suitability index (HSI) as per ARG UK Advice Note 5⁹. This allowed eDNA sampling to be targeted to 7 water bodies with an HSI of average or above.
- 5.35 Water samples for eDNA analysis to determine presence of Great Crested Newt were collected from 7 waterbodies within the survey area. The survey visits were carried out within the optimum period of mid-April to late June.
- 5.36 The eDNA sampling kits were supplied by SureScreen Scientifics and the survey methodology followed the Natural England protocol (Biggs *et al*, 2014¹⁰)

Otter

- 5.37 Field signs of Otter were searched for by an ecologist who meets the required competency level for Otter surveys (CIEEM, 2020¹¹). This required an inspection of all reed banks and channel features within 30 metres of the proposed development. Spraint, footprints, slides, and possible holts and couches were looked for (Appendix 5.6).

Water Vole

- 5.38 All areas within 10 metres of watercourses and 30 metres of the development footprint were carefully searched for field signs of Water Vole by an ecologist who meets the required competency level for Water Vole surveys (CIEEM, 2020¹²) (Appendix 5.7). Field signs include;
- Burrows - holes along the water's edge, and in the bank above, that are wider than high with a diameter of 4-8cm,

⁹ Downloaded 06/02/2020 from <https://www.arguk.org/downloads-in-pages/resources/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5>

¹⁰ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

¹¹ CIEEM, 2020. Technical Guidance Series. Competency for species survey: Otter. Downloaded on 08/02/2020 from <https://cieem.net/wp-content/uploads/2019/02/CSS-EURASIAN-OTTER-April-2013.pdf>

¹² CIEEM, 2020. Technical Guidance Series. Competency for species survey: Water Vole. Downloaded on 06/02/2020 from <https://cieem.net/wp-content/uploads/2019/02/CSS-WATER-VOLE-April-2013.pdf>

- Latrines - collections of droppings that are 8-12mm long, 4-5mm wide, cylindrical with blunt ends, green/brown/black and have no odour,
- Grazed lawns - nursing females on the nest graze vegetation around the burrow entrance short to form a 'lawn',
- Feeding remains - neat piles of chewed lengths of vegetation up to 10cm long and with 45 degree cuts to their ends,
- Runways in vegetation - low runs or tunnels 5-10cm wide pushed through the vegetation leading to the water's edge, burrow entrances or favoured feeding areas,
- Water Voles sightings.

Flora (reens)

5.39 Habitats were classified using a variation on the NVC Survey methodology (Rodwell, J.S., 2006¹³), with identification of stands of vegetation at particular sample points chosen along the reens (Appendix 5.8). All vascular plants found within the aquatic, margin and bank environments at areas identified as having uniform stand of vegetation within a 10 metre length for each sample point, using 1m² quadrats (size of quadrat chosen to take in to account size and difficulty of sampling aquatic habitat in reens), were recorded. As per NVC methodology, plant species found in each quadrat were then accorded a Domin value of cover/abundance, with each species then being assigned a Constancy/frequency value. For plant communities occupying areas without obvious stands of vegetation, quadrats were not used, but species lists compiled and Domin values estimated.

Ditches

5.40 Ditches have been categorised as to their favourable condition in relation to Gwent Levels SSSI based on NRW categories (LEMP Appendix 2.3).

5.41 Ditches in favourable condition are categorised as:

- 1 - Ditch open on one side and hedged on other side (single hedged)
- 4a - Intermittent hedge (gappy hedge) on one or both sides of ditch
- 4b - Ditch has water in it (at least 5cm deep) and no hedge on either side (ditch is open)

5.42 Ditches in unfavourable condition are categorised as:

- 2 - ditch hedged on both sides (double hedged)
- 2d - ditch hedged on both sides (double hedged) and dry
- 3 - Ditch is dry and has no hedge on either side (is open)

¹³ Rodwell, J.S. (2006) National Vegetation Classification: Users' Handbook. Peterborough: Joint Nature Conservation Committee.

- 4c - hedge on one side of ditch and intermittent hedge (gappy hedge) on other side

Limitations

- 5.43 All areas of the assessment site were readily accessible during surveys. However, it must be realized that surveys only provide a snapshot of a site at a given time.
- 5.44 Although some plant species would have not been visible during the preliminary ecological appraisal, this is not considered a significant constraint as further botanical surveys were completed along reens during the optimal survey period.
- 5.45 Due to the presence of livestock and harvesting operations, remote bat monitors could not be placed in the center of fields during all months. In addition, tall maize crops in August/September required bat activity transect routes to travel along field edges as the centres of fields became inaccessible. This is not considered a significant constraint, as most bat activity will have been associated with field margins.

Impact assessment method

- 5.46 The assessment of impacts has been carried out in accordance with the principles described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018¹⁴).
- 5.47 The ecological feature or resource that is affected by an impact is referred to as the receptor. Impacts are considered in terms of the value of the receptor in the context of nature conservation, and the character of the impact. From these the significance of the impact is determined.
- 5.48 As part of the impact assessment, the available means to avoid, minimise or mitigate for adverse impacts are incorporated into the design, so that the final impact assessment identifies the residual (net) impacts that are predicted. The consequences for development control, policy guidance and legislative compliance can then be identified.

Method for valuation of receptors

- 5.49 The nature conservation value, or potential value, of an ecological receptor is determined within the following geographic context:
- International importance (e.g. internationally designated sites such as Special Areas of Conservation, Special Protection Areas, Ramsar sites);

¹⁴ CIEEM, 2018. GUIDELINES FOR ECOLOGICAL IMPACT ASSESSMENT IN THE UK AND IRELAND Terrestrial, Freshwater, Coastal and Marine. Ver 1.1
Downloaded 06/02/2020 from <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/>

- National importance (e.g. nationally designated sites such as Sites of Special Scientific Interest or species populations of importance in the UK context);
- County importance (e.g. SNCI, habitats and species populations of importance in the context of Newport);
- Local importance (e.g. important ecological features such as old hedges, woodlands, ponds);
- Site importance (e.g. habitat mosaic of grassland and scrub which may support a diversity of common wildlife species);
- Negligible importance. Usually applied to areas such as built development or areas of intensive agricultural land.

5.50 The examples are not exclusive and are subject to further professional ecological judgment.

Impact Assessment Criteria

5.51 The assessment of potential impacts arising due to the development considers on-site impacts (i.e. within the footprint of the works) and those that may occur to adjacent and more distant ecological features.

5.52 Potential effects on valued receptors, adverse or positive, are identified for both the construction and operational phases. The effects are then assessed and characterised according to the following criteria:

- Direction (positive, adverse, or neutral)
- Magnitude of impact
- Spatial extent over which the impact would occur
- The temporal duration of the impact
- Permanence
- Frequency and timing
- Potential for cumulative effects.

5.53 The assessment identifies any information gaps and any uncertainties that may be material in the confidence of predicting effects. Confidence levels are assigned following the CIEEM (2016) scale. Confidence in predictions is given as:

- Certain/near-Certain: probability estimated at 95% chance or higher.
- Probable: probability estimated above 50% but below 95%.
- Unlikely: probability estimated above 5% but less than 50%.
- Extremely Unlikely: probability estimated at less than 5%.

5.54 The precautionary principle is applied whenever there is substantial doubt. The impact timescale is given as:

- Acute, immediate, and discrete;

- Short-term: 0-3 years;
- Medium term 3-10 years; and
- Long term: 10 years +.

5.55 Effects include, but are not restricted to:

- loss or change of habitat;
- disturbance during construction, operation, and decommissioning;
- chemical effects from airborne pollutants
- contravention of legal status or protection (including where the receptor would not meet or exceed the value threshold).

5.56 The assessment identifies those positive and negative impacts which would be ‘significant’, based on the integrity and the conservation status of the ecological feature. Impacts are unlikely to be significant where features of local value or sensitivity are subject to small scale or short-term impacts. However, where there are several small-scale impacts that are not significant alone, it may be that, cumulatively, these may result in an overall significant impact.

5.57 For the purposes of this assessment, the significance of the effect is determined using the matrix in Table 5.3 where the scale of the effect is measured against the value of the receptor.

5.58 Ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. For the purposes of this assessment, the effects that are identified in shaded cells are significant.

Table 5-3. Matrix for assessment of significance of effect

Scale of effect	Evaluation of nature conservation receptor				
	Very high/ International	High/ national	Medium/ regional	Low/ local	Negligible/site only
Major positive effect	Large positive	Large positive	Large positive	Large positive	Large positive
Intermediate positive effect	Moderate positive	Moderate positive	Moderate positive	Moderate positive	Moderate positive
Minor positive effect	Slight positive	Slight positive	Slight positive	Slight positive	Slight positive
Neutral	None	None	None	None	None
Minor negative effect	Slight adverse	Slight adverse	Slight adverse	Slight adverse	None
Intermediate negative effect	Large adverse	Large adverse	Moderate adverse	Slight adverse	None
Major negative effect	Very large adverse	Very large adverse	Large or moderate adverse	Slight adverse	None

European Protected Sites– definition of significance of effect

5.59 For a European Protected Site, such as SPA, the integrity of a site is:

'the coherence of the ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.'

5.60 Disturbance should not have a significant effect on the integrity of a European Protected Site.

European Protected Species – definition of significance of effect

5.61 The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) require that disturbance should not:

'significantly affect the ability of any significant group of animals of that species to survive, breed, or rear or nurture their young; or the local distribution or abundance of that species'.

5.62 Any effect above this threshold would be defined as significant for a European Protected Species.

Mitigation

5.63 Where there is potential that the proposed development will have a significant effect on a valued ecological feature of nature conservation interest, recommendations for mitigation are made based on the mitigation hierarchy detailed in Paragraph: 018 Reference ID: 8-018-20140306 of National Planning Practice Guidance;

- Avoidance –significant harm to wildlife species and habitats should be avoided through design.
- Mitigation – where significant harm cannot be wholly or partially avoided, it should be minimised by design, or by the use of effective mitigation measures that can be secured by, for example, conditions or planning obligations.
- Compensation – where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, this should be properly compensated for by measures to provide for an equivalent value of biodiversity.

Enhancement

5.64 Enhancements are additional to any mitigation measures that are necessary to deal with potential impacts on site. They are an opportunity to provide new benefits for biodiversity as a consequence of the development being implemented.

BASELINE

Statutory nature conservation sites

- 5.65 The assessment site is within the Gwent Levels SSSI - Redwick and Llandevenny unit.
- 5.66 The assessment site is immediately adjacent to Gwent Levels SSSI – Magor and Undy Unit.
- 5.67 Magor Marsh SSSI is located 430 meters to the north east of the assessment site.
- 5.68 The following SSSI are also within the Zone of Influence:
- Gwent Levels - Whitson
 - Gwent Levels - Nash and Goldcliff
 - Penhow Woodlands
 - Langstone-Llanmartin Meadows
 - Rectory Meadow - Rogiet
- 5.69 The Severn Estuary 1.3km to the south has a number of nationally and internationally important designated sites:
- Severn Estuary SPA - This site was designated due to its importance during the spring and autumn migration periods for waders moving up the west coast of Britain, as well as in winter for large numbers of waterbirds, especially swans, ducks and waders.
 - Severn Estuary Ramsar - The site is particularly important for the run of migratory fish between the sea and rivers via the estuary, and migratory birds during spring and autumn migrations.
 - Severn Estuary SAC - The site is important for fish species and estuarine habitats.
 - Severn Estuary SSSI - Estuarine fauna including water fowl, migratory fish, invertebrates. Important for wintering and passage birds.
- 5.70 Of these sites, it is expected that the construction and operation of the proposed solar PV array would have a negligible effect on the following types of interest features:
- Distant interest features that are non-motile, mainly plants;
 - Invertebrates associated with distant SSSIs that do not disperse widely;
 - Sites that support motile species that would not be found in association with the habitats present at the development site;
 - Habitat interest features associated with distant sites.
- 5.71 On this basis, significant effects on the following protected sites can be discounted:
- Gwent Levels - Nash and Goldcliff SSSI
 - Langstone-Llanmartin Meadows SSSI
 - Penhow Woodlands SSSI

- Gwent Levels - Whitson SSSI
- Rectory Meadow - Rogiet SSSI
- Severn Estuary SAC

5.72 Significant effects cannot be discounted at this stage for the following sites:

- Gwent Levels – Redwick and Llandeenny SSSI
- Gwent Levels - Magor and Undy SSSI
- Magor Marsh SSSI
- Newport Wetlands SSSI
- Severn Estuary SSSI/SPA/RAMSAR

Gwent Levels – Redwick Llandeenny SSSI

5.73 The proposed development is located within Gwent Levels – Redwick and Llandeenny SSSI. The Gwent Levels constitute the lowlands between Cardiff and Chepstow, and are drained by an ordered network of drainage ditches. They are an example of one of the most extensive areas of reclaimed wet pasture in Great Britain, which includes the Somerset Levels, Romney Marsh and the Pevensey Levels, and is the largest area of its kind in Wales. Together, these Levels systems constitute a national series of sites each with its own special features. The Gwent Levels – Redwick and Llandeenny SSSI has been selected for:

- Reen and ditch habitat
- Insects and other invertebrates
- Shrill Carder Bee

5.74 Receptor evaluation: Gwent Levels – Redwick Llandeenny SSSI is of National (UK) value.

Gwent Levels - Magor and Undy SSSI

5.75 Gwent Levels - Magor and Undy SSSI is to the immediate east of the assessment site, just beyond Backwall Lane. The Gwent Levels - Magor and Undy SSSI has been selected for:

- Reen and ditch habitat
- Insects and other invertebrates
- Shrill Carder Bee

5.76 Receptor evaluation: Gwent Levels – Magor and Undy SSSI is of National (UK) value.

Magor Marsh SSSI

5.77 Magor Marsh SSSI is located 340 metres to the east of the proposed solar PV array. This SSSI is the largest remnant of the formerly extensive fenlands near the Gwent coast. It lies on estuarine alluvium but receives run-off from an area of Carboniferous Limestone. Magor Marsh SSSI has been selected for:

- Reed beds and aquatic plants
- Wet meadow
- Reens and ponds
- Importance for breeding water and marsh birds including Cetti's Warbler, Reed Warbler, Coot, Moorhen, Water Rail and Little Egret

5.78 Receptor evaluation: Magor Marsh SSSI is of National (UK) value.

5.79 It is expected that the construction and operation of the proposed solar PV array would have a negligible effect on the habitat features of this SSSI. An assessment of impact on the ornithologist interest of this receptor is included in the Ornithology chapter, and this SSSI is not considered further within this chapter.

Newport Wetlands SSSI

5.80 This SSSI lies 4.5km to the south west within the Gwent Levels, part of an area of low lying lands between Cardiff and Chepstow, which is drained by an ordered network of drainage ditches. Newport Wetlands SSSI has been selected for;

- Winter and breeding birds
- invertebrates
- aquatic plants and reed beds

5.81 Receptor evaluation: Newport Wetlands SSSI is of National (UK) value.

5.82 It is expected that the construction and operation of the proposed solar PV array would have a negligible effect on the invertebrate, and aquatic plant and reedbed features of this SSSI. An assessment of impact on the ornithologist interest of this receptor is included in the Ornithology chapter and this SSSI is not considered further within this chapter.

Severn Estuary SSSI

5.83 The Severn Estuary 1.3km to the south lies on the south west coast of Britain at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers. The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. Severn Estuary SSSI has been selected for:

- Intertidal habitats
- Saltmarsh
- Internationally important populations of waterfowl
- Migratory fish
- Benthic invertebrates

5.84 Receptor evaluation: Severn Estuary SSSI is of National (UK) value.

5.85 It is expected that the construction and operation of the proposed solar PV array would have a negligible effect on the benthic invertebrate, saltmarsh and intertidal habitats, and the majority of migratory fish of this SSSI due to separation distance. Only European Eel *Anguilla anguilla* are considered here. An assessment of impact on the ornithologist interest of this receptor is included in the Ornithology chapter.

5.86 The Severn Estuary also has the following International designations:

Severn Estuary RAMSAR

5.87 The Severn Estuary is important for migratory birds during spring and autumn migrations. The site also regularly supports more than 20,000 waterfowl along with migratory fish.

5.88 It is expected that the construction and operation of the proposed solar PV array would have a negligible effect on the majority of migratory fish. Only European Eel *Anguilla anguilla* are considered here. An assessment of impact on the ornithologist interest of this receptor is included in the Ornithology chapter.

5.89 Receptor evaluation: Severn Estuary RAMSAR is of International value.

Severn Estuary SPA

5.90 This Severn Estuary has been designated a SPA due to its importance during the spring and autumn migration periods for waders moving up the west coast of Britain, as well as in winter for large numbers of waterbirds, especially swans, ducks and waders.

5.91 An assessment of impact on the ornithologist interest of this receptor is included in the Ornithology chapter, and this SPA is not considered further within this chapter.

5.92 Receptor evaluation: Severn Estuary SPA is of International (European) value.

Non-statutory nature conservation sites

5.93 There are five Sites of Importance for Nature Conservation (SINC) within 1 km:

- Barecroft Fields
- Blackwall Lane Field
- Bowkett Field, Barecroft
- Land at Barecroft Common
- Bluehouse Farm

5.94 Due to separation distance between the proposed development and the three distant SINC, it is extremely unlikely that the proposed development size and type would adversely impact the species or habitats for which these sites have been selected.

5.95 The two adjacent NNCSs are Barecroft Fields and Blackwall Lane Field both selected for Marshy Grassland and Common Meadow-rue *Thalictrum flavum*. Due to separation from the development by reens, it is unlikely that these areas will be adversely impacted by the proposed solar PV farm.

5.96 Receptor evaluation: SINCS are of County value.

Valued Habitats

5.97 A phase 1 habitat survey was completed in 2019 and updated in 2021 (Appendix 5.1) and habitats are detailed in Table 5-4.

Table 5-4 Phase 1 habitats

Habitat type	Area	Ecological value
Improved grassland	26.74 ha	Site
Arable	59.22 ha	Negligible
Tall ruderal	0.36 ha	Site
Reen	0.26 ha	National
Ditch	1.18 ha	National
Intact hedge, native species rich	5.67 km	Local
Intact hedge and trees, native species rich	3.27 km	Local

Coastal and floodplain grazing marsh

5.98 Much of the assessment site comprised grassland that has been improved to provide fodder and forage for livestock dominated by locally abundant Perennial Rye-grass *Lolium perenne*. The remainder of the assessment site comprised forage Maize *Zea mays* with tall grasses, herbs and scrub at margins including Cock’s Foot *Dactylis glomerata*, Perennial Rye-grass, Yorkshire Fog *Holcus lanatus*, Timothy *Phleum pratense*, Creeping Thistle *Cirsium arvense*, Hogweed *Heracleum sphondylium*, Redshanks *Persicaria maculosa*, Bramble *Rubus fruticosus* and occasional Common Reed *Phragmites australis*. An area of managed land adjacent to reens in the east of the assessment site supported locally abundant Broad-leaved Dock *Rumex obtusifolius* amongst Perennial Rye-grass, Annual Meadow-grass *Poa annua* and Smooth Sow-Thistle *Sonchus oleraceus*.

5.99 Farmyard manure stores within improved grassland supported abundant ruderal herbs including Fat Hen *Chenopodium album*, Broad-leaved Dock and Common Nettle *Urtica dioica*.

5.100 Improved grassland within the assessment site qualifies as “Coastal and floodplain grazing marsh” a Section 7 habitat and Local Biodiversity Action Plan priority habitat.

5.101 Receptor evaluation: This habitat is of County value.

Intact hedge, species rich

5.102 The internal boundaries comprise close-managed, species rich hedgerows with diverse native woody shrubs and trees.

- 5.103 Hedgerows would qualify as a Local Biodiversity Action Plan Priority Habitat and a Section 7 habitat, whilst hedgerows are an interest features of Gwent Levels – Redwick and Llandeenny SSSI.
- 5.104 Receptor evaluation: Assessed in isolation from their inclusion in the SSSI designation, hedgerows are of Local value.

Reens

- 5.105 The assessment site is bisected by reens that are typically at least 2 metres wide, free from shading vegetation, have some water flow and are managed.
- 5.106 Reens are part of an area of coastal and floodplain grazing marsh, and as such are listed under Section 7 of the Environment (Wales) Act 2016 and are a Local Biodiversity Action Plan priority habitat.
- 5.107 This habitat is part of a network that are an interest feature of the Gwent Levels – Redwick and Llandeenny SSSI.
- 5.108 Receptor evaluation: Assessed in isolation from their inclusion in the SSSI designation, reens are of County value.

Ditches

- 5.109 Fields are enclosed by ditches, the majority of which are heavily shaded beneath hedgerows of native shrubs associated with the ditch banks. In places, these ditches are dry or choked with dead vegetation.
- 5.110 Ditches are part of an area of coastal and floodplain grazing marsh, and as such are listed under Section 7 of the Environment (Wales) Act 2016 and are a Local Biodiversity Action Plan priority habitat.
- 5.111 This habitat is part of a network of reens that are an interest feature of the Gwent Levels – Redwick and Llandeenny SSSI.
- 5.112 Receptor evaluation: Assessed in isolation from their inclusion in the SSSI designation, ditches are of Local value.

Notable species

Amphibians

- 5.113 There are 2 records for Common Frog, 4 records for Smooth Newt and 2 records for Great Crested Newt within 2km.
- 5.114 The majority of ditches lacked aquatic vegetation likely to support amphibians, were shallow and obstructed with leaf-litter.

- 5.115 Receptor evaluation: The assessment site is of Local value for common and widespread amphibians.
- 5.116 Great Crested Newt eDNA surveys (Appendix 5.5) were completed on suitable water bodies, with results indicating that one watercourse in the east (Ditch 50/Backwall Reen) had been used by Great Crested Newt. All other waterbodies had either a low Habitat Suitability Index, or eDNA results were negative.
- 5.117 Receptor evaluation: The majority of water courses are of Negligible value for Great Crested Newt. Ditch 50/Backwall reen is of Local value for Great Crested Newt.

Badgers

- 5.118 There are 2 records for Badger within 2 km of the Site.
- 5.119 No Badger setts or well-trodden pathways are present within the zone of influence, although occasional foraging scrapes were noted (Appendix 5.4).
- 5.120 Receptor evaluation: The assessment site is of Site value for Badgers.

Bats

- 5.121 There are 66 records for bats within 2km of the assessment site. The species recorded are detailed in Table 5.5. The nearest record for a known bat roost is 0.6km distant and describes an unknown bat roost in 1986.

Table 5-5. Bat records within 2km

Common name	Number of records
Bat	2
Common Pipistrelle	43
Greater Horseshoe	1
Lesser Horseshoe	3
Nathusius' Pipistrelle	1
Noctule	13
Soprano Pipistrelle	1
Whiskered	1

- 5.122 Six species and two Genus of bats were recorded during bat activity transects and remote monitoring (Appendix 5.3). 97% of the recorded bat activity was associated with Common Pipistrelle and Noctule bats. Occasional trees associated with boundary features have Low potential for day roosting bats.
- 5.123 Receptor evaluation: The assessment site is of Local value for Bats.

Common dormice

- 5.124 The biological record search returned no records for Common dormice within 2km.

- 5.125 Habitats associated with the assessment site are suboptimal for this species due to limited diversity of native shrubs, tendency to flooding and a lack of connectivity to suitable dormouse habitats.
- 5.126 Common Dormouse surveys were completed on the proposed development site and within the breeding lapwing mitigation area in 2021 during which time no evidence of dormice were found.
- 5.127 Receptor evaluation: The assessment site is of Negligible value for Common Dormice.

Otter

- 5.128 The biological record search returned 495 records for Otter within 2km. With the exception of 56 records at the assessment site boundaries for droppings/spraint or footprints largely associated with Mink monitoring rafts, all of these records are outside the proposed development footprint.
- 5.129 Occasional Otter spraint is present on Eel passes within reens, although no couching habitat of holts are present and there is no suitable natal holt habitat locally (Appendix 5.6).
- 5.130 Receptor evaluation: The assessment site is of Site value for Otter.

Water Vole

- 5.131 The biological record search returned 2707 records for Water Vole within 2km. The majority of these records are to the east of the assessment site, associated with Magor Marsh, although there are a cluster of records at the north eastern boundary of the assessment site in the period 2013 to 2016.
- 5.132 Evidence of Water Vole activity was found along the western end of Ynys Mead Reen comprising burrows, latrines and droppings. No recent Water Vole activity was found elsewhere although abundant holes that appear unused are present in reen banks (Appendix 5.7).
- 5.133 Receptor evaluation: The assessment site is of Local value for Water Vole.

European Eel

- 5.134 The biological records search returned 15 records for European Eel within 2km, including records on boundary reens.
- 5.135 Eel-passes have been fitted to the water level control gates along Rush Wall Reen. Although it is likely that Eels are present in reens, these are unlikely to be optimal habitats due to a lack of underwater refugia and regular maintenance. European Eel are considered Critically Endangered¹⁵.

¹⁵ Jacoby, D. & Gollock, M. 2014. *Anguilla anguilla*. The IUCN Red List of Threatened Species 2014: e.T60344A45833138. <https://dx.doi.org/10.2305/IUCN.UK.2014-1.RLTS.T60344A45833138.en>. Downloaded on 08 February 2020.

5.136 Receptor evaluation: The assessment site is of County value for European Eel.

Reptiles

5.137 The biological record search returned 5 records for Grass Snake.

5.138 Boundary habitats have some potential for Grass Snake, although the managed improved grassland and arable habitat within the footprint would be unlikely to support reptiles. Mating Grass Snake were recorded during the Water Vole survey in tall grassland along Ynys Mead Reen.

5.139 Receptor evaluation: The assessment site is of Local value for Grass Snake.

Invertebrates

5.140 The biological record search returned 67 records for a number of notable invertebrates within 2km including 3 records for Shrill Carder Bee close to the eastern site boundary. These are listed in Table 5-6 below.

Table 5-6 Notable invertebrate records within 2km

Latin name	Common Name	Conservation status	Count
<i>Agonopterix atomella</i>	Greenweed Flat-body	S7, UKBAP, RD2 (UK)	1
<i>Boloria euphrosyne</i>	Pearl-bordered Fritillary	WCA5, S7, UKBAP, RD1 (UK), RD2 (UK), LBAP (BBNP, CER, CON, DEN, FLI, PEM, POW), LI(SEWBReC), LI(VC43)	1
<i>Bombus ruderarius</i>	Red-shanked Carder-Bee	S7, LBAP (FLI, MTR, VOG)	1
<i>Cupido minimus</i>	Small Blue	WCA5, S7, UKBAP, RD1 (UK), LBAP (CON, PEM, VOG), LI(SEWBReC)	1
<i>Hipparchia semele</i>	Grayling	S7, UKBAP, RD1 (UK), LBAP (BRG, CDF, GWY, RCT, VOG), LI(BIS), LI(SEWBReC), LI(VC43)	1
<i>Leptidea sinapis</i>	Wood White	WCA5, S7, UKBAP, RD1 (UK), RD2 (UK), LBAP (POW, VOG), LI(SEWBReC)	1
<i>Rhizedra lutosa</i>	Large Wainscot	S7, UKBAP, LBAP (BRG, GWY)	4
<i>Bombus humilis</i>	Brown-banded Carder-Bee	S7, LBAP (CER, CON, FLI, GWY, PEM, POW, VOG)	21
<i>Bombus sylvarum</i>	Shrill Carder Bee	S7, RDB2 (UK) - NB, LBAP (CER, FLI, PEM, VOG)	31

5.141 A total of 26 invertebrate species were recorded during the field survey (Table 5-7), none of which are interest features of the Gwent levels SSSI, nor species of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales (Appendix 5.2).

5.142 The reens were considered suboptimal for rare and scarce invertebrates. Many are deep-sided, shaded by scrub and at the time of the survey covered in a dense blanket of duckweed. The results indicate they are currently of little importance for rare or scarce invertebrates.

Table 5-7 Aquatic invertebrate survey results

Crustacea
Isopoda
<i>Asellus aquaticus</i>
<i>Crangonyx pseudogracilis</i>
Insects
Coloeptera (Beetles)
<i>Anacaena globulus</i>
<i>Anacaena limbata</i>
<i>Haliphus lineatocollis</i>
<i>Haliphus ruficollis</i>
<i>Helophorus brevipalpis</i>
<i>Helophorus grandis</i>
<i>Helophorus minutus</i>
<i>Helophorus obscurus</i>
<i>Hydroporus angustatus</i>
<i>Hydroporus palustris</i>
<i>Hydroporus planus</i>
<i>Hydroporus pubescens</i>
<i>Hygrotus inequalis</i>
<i>Ilybius montanus</i>
<i>Noterus clavicornis</i>
<i>Stenus boops</i>
Odonata (Damsel and Dragonflies)
<i>Telmatophilus typhae</i>
<i>Ischnura elegans</i>
Corixidae (Lesser water boatmen)
<i>Corixa punctata</i>
<i>Notonecta glauca</i>
Mollusca (Snails)
<i>Anisus vortex</i>
<i>Planorbis planorbis</i>
<i>Radix balthica</i>
<i>Sphaerium corneum</i>

- 5.143 No Shrill Carder Bees were encountered within the survey area, although a single worker was present outside the survey site, along with a single Brown-Banded Carder Bee. Habitats within the development footprint lacks species rich grassland suitable for Shrill Carder Bees.
- 5.144 Receptor evaluation: The assessment site has been designated as Nationally important for invertebrates.

Plants

5.145 The biological record search returned 36 records for notable plants. With the exception of a single record for Tubular Dropwort *Oenanthe fistulosa*, all records are distant from the assessment site. These are listed in Table 5.8.

Table 5-8. Notable plant records within 2km

Latin name	Common Name	Conservation status	Count
<i>Bupleurum tenuissimum</i>	Slender Hare's-ear	S7, UKBAP, RD1 (UK), RD2 (UK), LBAP (CON, FLI, VOG), LI(VC51, LR)	1
<i>Hyacinthoides non-scripta</i>	Bluebell	WCA8	4
<i>Oenanthe fistulosa</i>	Tubular Water-dropwort	RDB1 [UK] - DD, RDB2 [UK] - R	31

5.146 Improved grassland and arable habitats within the footprint of the proposed solar PV array do not support plants of restricted distribution, whilst no notable plants were recorded during the NVC assessment.

5.147 Receptor evaluation: The assessment site has been designated as Nationally important for aquatic plants.

Future baseline

5.148 Provided water levels are appropriately managed, it is unlikely that the baseline will change significantly over the lifetime of the development.

LEGISLATION AND POLICY

Nature Conservation Legislation

European Red Data lists (IUCN, 2000)

- 5.149 International Union for Conservation of Nature (IUCN) and the European Commission have been working together on an initiative to assess around 6,000 European species according to IUCN regional Red Listing Guidelines. Through this process they have produced a European Red List identifying those species which are threatened with extinction at the European level so that appropriate conservation action can be taken to improve their status.

The Wildlife and Countryside Act (WCA) 1981 (as amended)

- 5.150 This Act is the primary legislation that protects animals, plants and certain habitats in the UK. This includes the designation and protection of some of the best areas of natural environment as Sites of Special Scientific Interest (SSSI). The following SSSI are within the zone of influence:

- Gwent Levels - Redwick And Llandevenny
- Gwent Levels - Magor and Undy
- Gwent Levels - Whitson
- Gwent Levels - Nash and Goldcliff
- Magor Marsh
- Newport Wetlands
- Penhow Woodlands
- Langstone-Llanmartin Meadows
- Rectory Meadow – Rogiet
- Severn Estuary

- 5.151 The following animals are protected to different degrees under Schedules within this Act:

- All bats
- Otter
- Water Vole
- All native reptiles
- All native amphibians

The Conservation of Habitats and Species Regulations 2017

- 5.152 The Conservation of Habitats and Species Regulations 2017 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law.

- 5.153 The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species. These sites form a network termed Natura 2000 and include Special Areas of Conservation (SAC) and Special Protection Areas (SPA).
- 5.154 Severn Estuary SPA and Severn Estuary SAC are within 1.3km of the Assessment Site.
- 5.155 All bats, Otter, Common Dormice and Great Crested Newt are listed as European Protected Species. It is an offence deliberately to kill, capture, or disturb a European Protected Species, or to damage or destroy the breeding site or resting place of such an animal.

Protection of Badgers Act 1992

- 5.156 The Protection of Badgers Act 1992 consolidated and improved previous legislation. Under the Act it is an offence to kill, injure or take a Badger, or to damage or interfere with a sett used by a Badger unless a licence is obtained from a statutory authority.

The Eels (England and Wales) Regulations 2009

- 5.157 This regulation applies to fishing, restocking, export and the passage of Eel, including “the construction or maintenance of a structure in or near waters that amounts to, or is likely to amount to, an obstruction.”

The Hedgerow Regulations 1997

- 5.158 The Hedgerows Regulations 1997 protect certain hedgerows from being removed (uprooted or destroyed) if they meet certain criteria.

The Countryside and Rights of Way (CRoW) Act 2000

- 5.159 This Act increases measures for the management and protection for Sites of Special Scientific Interest (SSSI) and strengthens wildlife enforcement legislation.

Circular 06/2005 Biodiversity and geological conservation – statutory obligations and their impact within the planning system

- 5.160 This circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements the national planning policy in the National Planning Policy Framework and the Planning Practice Guidance.

Natural Environment and Rural Communities Act 2006

- 5.161 The Act made amendments to both the Wildlife and Countryside Act 1981 and the Countryside and Rights of Way (CRoW) Act 2000. For example, it extended the CRoW biodiversity duty to public bodies and statutory undertakers.

Biodiversity strategies

UK Post-2010 Biodiversity Framework, 2012

- 5.162 The 'UK Post-2010 Biodiversity Framework', published in July 2012, succeeds the UK BAP and 'Conserving Biodiversity – the UK Approach', and is the result of a change in strategic thinking.

The natural choice: securing the value of nature (2011) (Natural Environment White Paper)

- 5.163 This White Paper outlines the Government's vision for the future of landscape and ecosystem services.

Environment (Wales) Act 2016

- 5.164 Part 1 of the Environment Act sets out Wales' approach to planning and managing natural resources at a national and local level with a general purpose linked to statutory 'principles of sustainable management of natural resources' defined within the Act.

Section 6 - Biodiversity and resilience of ecosystems duty

- 5.165 Section 6 of the Act places a duty on public authorities to 'seek to maintain and enhance biodiversity' so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to 'promote the resilience of ecosystems'. The duty replaces the section 40 duty in the Natural Environment and Rural Communities Act 2006 (NERC Act 2006), in relation to Wales, and applies to those authorities that fell within the previous duty.

- 5.166 Public authorities will be required to report on the actions they are taking to improve biodiversity and promote ecosystem resilience.

Section 7 - Biodiversity lists and duty to take steps to maintain and enhance biodiversity

- 5.167 This section replaces the duty in section 42 of the NERC Act 2006. The Welsh Ministers will publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales.

- 5.168 The Welsh Ministers must also take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section, and encourage others to take such steps

- 5.169 Water Vole, Otter, Common Dormice, Noctule, Common Pipistrelle, (Brown) Long-eared bat, Lesser Horseshoe bat, Grass Snake, Great Crested Newt, hedgerows and reed (coastal and floodplain grazing marsh) are all included on the biodiversity lists, and are present within the assessment site.

County Level

- 5.170 Newport City Council's Local Biodiversity Action Plan (LBAP) has a list of special habitats and species in the area and outlines how, in partnership, they plan to protect and enhance them.
- 5.171 Water Vole, Otter, Great Crested Newt, Noctule, Common Pipistrelle, (Brown) Long-eared bat, Lesser Horseshoe bat, hedgerows and reed (coastal and floodplain grazing marsh) are all included on the LBAP and are present at the assessment site boundaries.

ECOLOGICAL EVALUATION OF RECEPTORS

- 5.172 The ecological receptors to be considered for significant effects are given in Table 5.9. These are of local or higher value; those ecological receptors that have less than local value are not considered further unless they are European Protected Species and there is potential for them to be present (in which case the regulatory context i.e. the Habitats Regulations 2017 is considered), or they are the subject of national legislation (i.e. Wildlife and Countryside Act 1981).
- 5.173 Impact associated with the Severn Estuary SPA, and avian interest features of nearby nature conservation sites are properly assessed within the Ornithology chapter and are not considered further here.

Table 5-9. Table of ecological receptors to be considered for significant effects

Receptor	Status	Valuation
Severn Estuary RAMSAR	Ramsar Convention of Wetlands	International
Gwent Levels SSSI - Redwick and Llandevenny	Wildlife and Countryside Act 1981	National (United Kingdom)
Gwent Levels SSSI - Magor and Undy SSSI	Wildlife and Countryside Act 1981	National (United Kingdom)
Barecroft Fields SNCI	Sites of Nature Conservation Importance	County (Newport)
Blackwall Lane Field SNCI	Sites of Nature Conservation Importance	County (Monmouth)
Coastal and floodplain grazing marsh	Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority habitat	County (Monmouth)
Intact hedge, native species rich	Environment (Wales) act 2016, Section 7 Local biodiversity Action plan priority habitat Hedgerow Regulations 1997	Local
Reens	Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority habitat	County (Newport)
Ditches	Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority habitat	Local
Amphibians (common and widespread)	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 (Common Toad)	Local
Great Crested Newt	European Protected Species Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Local
Bats	European Protected Species Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Local

Receptor	Status	Valuation
Otter	European Protected Species Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Site
Water Vole	European Protected Species, Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Local
European Eel	The Eels (England and Wales) Regulations 2009 Environment (Wales) Act 2016, Section 7	County (Newport)
Reptiles (Grass Snake)	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7	Local
Invertebrates	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7	National
Plants	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7	National

The need for an appropriate assessment

- 5.174 An appropriate assessment is required by Regulation 48 of the Habitats Regulations 1994 implementing Article 6(3) of the Habitats Directive (92/43/EEC) in the event that it is considered a plan or project, not connected with the management of that site, is likely to have a ‘significant effect’ on any European (Natura) site, i.e. Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites.
- 5.175 The purpose of appropriate assessment is to ensure that protection of the integrity of European sites is a part of the planning process at a regional and local level. Permission can only be granted if it can be ascertained that the plan or project will not affect the integrity of the European site.
- 5.176 It is appropriate to use the information assembled for this EclA when carrying out the appropriate assessment under the Habitats Regulations.
- 5.177 There are three Natura sites within the surrounding area. However, the potential for impact on the majority of their qualifying Annex 1 habitats and Annex II species have been screened out, with the exception of ornithological interest, which is dealt with elsewhere, and fish for Severn Estuary Ramsar. This report provides an appropriate assessment for the potential of this project to impact fish species (European Eel) that are an interest feature of Severn Estuary Ramsar.

MITIGATION - THE PROPOSAL RESPONDS TO ITS UNIQUE LOCATION

Primary (embedded) mitigation

- 5.178 The Gwent Levels is a unique and ancient landscape designated as a Site of Special Scientific Interest (SSSI) for its ecological richness and diversity, much of which is associated with the presence of and maintenance regime associated with the drainage system which constitutes a network of drainage ditches, locally referred to as reens.
- 5.179 It is recognised that physical changes as a result of a solar park development in this location, such as changes in views or ground disturbance, would result from the proposal. These changes are referred to as impacts. The design and layout of the solar park has responded to the location's value and sensitivities in order to reduce the magnitude of such impacts through primary (embedded) mitigation, as detailed within 'Responding to the Environmental Sensitivity of the Site', in paragraphs 2.41 and 2.42 of Chapter 2.

Secondary Mitigation

- 5.180 The LEMP (at Appendix 2.3) includes further detail around the following activities associated with all phases of the development, in order to avoid or minimise impacts.

Construction phase

- 5.181 To avoid accidental damage to valued habitats, species and designated sites, exclusion zones to boundary features (reens, hedgerows and field ditches) will be protected from accidental damage by a suitable temporary fence during the construction phase. There will be no access, storage of materials, ground disturbance, burning or contamination within the fenced areas.
- 5.182 Horizontal Directional Drilling (HDD), as detailed in the LEMP, will be used to provide access across valued boundary features.
- 5.183 Locations of HDD rigs will be informed by pre-construction surveys for badger, water vole and otter, as detailed in the LEMP.
- 5.184 No night works will be completed in the bat active period, April to October inclusive.
- 5.185 Habitats with potential for Grass Snake likely to be affected by construction activities will be de-vegetated prior to any site activities under the supervision of a suitably qualified ecologist. Grassland to be removed will initially be strimmed to a height of no more than 20cm, having first used an ecologist to walk and beat the habitat. This will encourage reptiles to disperse naturally into the neighbouring uncut vegetation to the sides. After at least 24hrs a second cut will be made as close to ground/bank level as possible.

- 5.186 Prior to works commencing in Fields 22 and 23, a suitable fence will be constructed at the reen/ditch buffer edge to ensure Great Crested Newts do not enter the construction site, as detailed in Appendix 4 of the LEMP.
- 5.187 During dry periods, damping down exposed excavations and transitional surfaces will be adopted to suppress dust, as detailed in the CTMP.

Operational phase

- 5.188 Buffers to reens, hedgerows and ditches established during the construction phase will be retained during the operational phase. These buffers will be delineated by a suitable fence.
- 5.189 Following construction, construction phase access tracks will be removed, and the footprint of the track and bare areas beneath the solar arrays restored to agricultural grassland by re-seeding with a suitable grass mix. For the cable route, top and sub-soils will be stored separately and replaced in sequence following trenching, and the route re-seeded with a suitable grass mix.
- 5.190 In a central swathe through the site, buffer grassland will be cut for hay in late September every second year to enhance this area for Shril Carder Bee by creating a tussocky structure with nesting potential. These areas will be enhanced for this bee through additional plantings of wildflowers.
- 5.191 To ensure the development results in a positive outcome for the Gwent Levels SSSI, ditches associated with the site will be enhanced through scrub removal and long-term management during the operational phase of the development.

Efficacy of the secondary mitigation proposed

- 5.192 The majority of valued ecological receptors are associated with field boundary features. By ensuring boundary features are protected during all phases of development, the associated ecological receptors will be properly protected, and adverse effects avoided.
- 5.193 HDD will avoid adverse effect on habitats and species that are interest features of Gwent Levels SSSI.
- 5.194 Suitable management of 7.7ha of buffer grassland will provide significant habitat gain for Shril Carder Bee.
- 5.195 A comprehensive ditch management program will ensure at least 50% of ditches within field blocks 4 and 25 of Gwent Levels SSSI are in favourable condition.
- 5.196 The re-seeding of bare ground, and hydro-seeding permanent access tracks and parking/storage areas will minimise the loss of coastal floodplain and grazing marsh habitat, although there will be some unavoidable loss of this habitat due to inverter stations, the sub-station and its access track. Compensation for the loss in habitat area would not be practicable as this would require taking developed land from industry, housing or infrastructure within the Levels and returning this to agricultural land.

- 5.197 The adoption of a no night-works policy during the bat active period will ensure light-averse bats and nocturnal birds can continue to forage within the assessment site during the construction phase. The group of foraging bats recorded here would continue to use the assessment site following development, with the retention of exclusion zones and reduced agricultural management likely to enhance the operational site for bats.
- 5.198 The reasonable avoidance measures recommended to minimise impact on Grass Snake are regularly recommended for sites where this reptile may be present. Due to its rapid escape response to vibration and noise, this is a very effective measure to minimise impact and avoid an offence under relevant wildlife legislation, whilst protection of boundary habitats within an exclusion zone will ensure the local conservation status of this species is maintained.
- 5.199 Installing newt fencing in Fields 22 and 23 along the edge of the exclusion zone at an appropriate time of the year (winter), will ensure Great Crested Newt are not present within the construction site during the construction phase. This will minimise impact and avoid an offence under relevant wildlife legislation, although a European Protected Species Mitigation License may be needed for lawful construction of the newt fence. Protection of boundary habitats within an exclusion zone will ensure the local conservation status of this species is maintained.
- 5.200 Suppression of dust, as detailed in the CTMP, will minimise the impact of wind-blown particles on the reed and ditch habitats.

ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

Construction phase

- 5.201 During the construction phase, there is predictable adverse effects which are generally unavoidable; many are temporary or short term and can be minimised as part of construction management, but some have the potential for more lasting effect. These include:
- Temporary habitat loss associated with temporary access routes, cable trenches, storage, site buildings and site compounds;
 - areas for plant maintenance and for storage of oils, fuels and chemicals;
 - dust generation;
 - environmental incidents and accidents;
 - lighting;
 - acoustic disturbance and vibration from construction activities;
 - ground excavation;
 - horizontal directional drilling operations;
 - removal of site offices and temporary compounds; and,
 - vegetation clearance.
- 5.202 However, the permanent loss of habitat under the development is addressed as an operational impact.
- 5.203 The potential for adverse impacts has been minimised as far as possible through the application of good practice techniques and adherence to well-designed method statements. These will be managed through the LEMP, CTMP and CEMP and are detailed as Primary (embedded) and Secondary mitigation.

Designated sites

Severn Estuary Ramsar

- 5.204 The proposed development is 1.3km to the north of the Severn Estuary Ramsar which is of International value.
- 5.205 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels which would impact European Eel populations. There is also potential for direct harm or injury, and the creation of barriers to their movement.
- 5.206 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure there is negligible potential for an adverse effect on this Ramsar during the construction phase.

Gwent Levels – Redwick and Llandeenny SSSI

- 5.207 The proposed development is located within Gwent Levels – Redwick and Llandeenny SSSI which is of National (UK) value.
- 5.208 The primary pathway of effect would be through changes in water quality and water levels, and damage to reens and ditch habitats.
- 5.209 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure there is negligible potential for an adverse effect on this SSSI during the construction phase.

Gwent Levels – Magor and Undy SSSI

- 5.210 The proposed development is adjacent to Gwent Levels – Magor and Undy SSSI which is of National (UK) value.
- 5.211 The primary pathway of effect would be through changes in water quality, water levels, and temporary habitat loss to construction activities. There is also potential for affect associated with dust deposition.
- 5.212 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure there is negligible potential for an adverse effect on this SSSI during the construction phase.

Barecroft Fields SINC

- 5.213 The proposed development is adjacent to Barecroft Fields SINC which is of County (Monmouth) importance.
- 5.214 The primary pathway of effect would be through dust deposition.
- 5.215 Adoption of the CEMP to control dust deposition will ensure there is negligible potential for an effect on this SINC during the construction phase.

Blackwall Lane Field SINC

- 5.216 The proposed development is adjacent to Blackwall Lane Field SINC which is of County (Monmouth) importance.
- 5.217 The primary pathway of effect would be through dust deposition.
- 5.218 Adoption of the CEMP to control dust deposition will ensure there is negligible potential for an effect on this SINC during the construction phase.

Valued Habitats

Coastal and floodplain grazing marsh

- 5.219 The proposed development is within an area of Coastal and floodplain grazing marsh of County importance. Land is in rotation and grassland (grazing marsh) areas will vary year on year. However, this habitat type is a landscape definition and the whole site should be considered as part of it.
- 5.220 The primary pathway of effect would be through direct habitat loss and damage.
- 5.221 It is near-certain that there will be a temporary loss of a limited extent of this habitat to the construction phase associated with ground disturbance, , compounds, storage areas and cable trenching. Following construction, re-seeding bare areas will ensure this negative effect would be minor, and short term for the period of construction.

Intact hedge, species rich

- 5.222 Hedgerows associated with field boundaries are of Local value and comprise approximately 9km of species rich hedgerows, Some with trees.
- 5.223 The primary pathway of effect would be through direct habitat loss and damage.
- 5.224 Protection of boundary habitats will ensure it is near-certain that there will be no effect on this receptor during the construction phase.

Reens

- 5.225 The site is enclosed and bisected by 0.26 ha of reens which are of County value.
- 5.226 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.
- 5.227 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Ditches

- 5.228 Fields are enclosed by hedgerows associated with 1.18ha of ditches that are of Local value.
- 5.229 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.
- 5.230 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Notable species

Amphibians

- 5.231 The assessment site is of Local value for common and widespread amphibians.
- 5.232 The primary pathway of effect would be through impacts to reens, ditches and adjacent terrestrial habitats, such as direct habitat loss and damage, and changes in water quality and water levels.
- 5.233 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.
- 5.234 will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Great Crested Newt

- 5.235 The assessment site is of Local value for Great Crested Newt.
- 5.236 The primary pathway of effect would be through impacts to reens, ditches and adjacent terrestrial habitats, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.
- 5.237 Disturbance, harm or injury to Great Crested Newt could be considered an offence under relevant wildlife legislation.
- 5.238 Protection of boundary habitats, adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, and exclusion from the development during construction will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Bats

- 5.239 The assessment site is of Local value for bats.
- 5.240 The primary pathway of effect would be through impacts to habitat features used by foraging bats, such as direct habitat loss and damage. There will be a short-term loss in grassland habitat associated with construction due to storage areas/compounds although these habitats are of little value for bats.
- 5.241 No potential roosting habitats will be affected and there is negligible potential for disturbance, direct harm or injury.
- 5.242 Protection of boundary habitats and no night working will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Otter

- 5.243 The assessment site is of Site value for Otter.
- 5.244 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.
- 5.245 Protection of boundary habitats, no night working, and informed siting of HDD drilling rigs as detailed within the LEMP (Appendix 2.3) will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Water Vole

- 5.246 The assessment site is of Local value for Water Vole.
- 5.247 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.
- 5.248 Protection of boundary habitats, no night working, and informed siting of HDD drilling rigs as detailed within the LEMP (Appendix 2.3) will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

European Eel

- 5.249 The assessment site is of County value for European Eel, whilst they are an interest feature of the Severn Estuary Ramsar.
- 5.250 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury, and the creation of barriers to their movement.
- 5.251 Protection of boundary habitats will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Reptiles (Grass Snake)

- 5.252 The assessment site is of Local value for Grass Snake.
- 5.253 The primary pathway of effect would be through impacts to reens and ditches, and other boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels that may affect prey items. There is also potential for direct harm or injury.
- 5.254 Protection of boundary habitats and adoption of reasonable avoidance measures during site clearance (Appendix 2.3 LEMP) will ensure it is near-certain that there will be no effect on this receptor during the construction phase.

Invertebrates

- 5.255 The assessment site is of National value for invertebrates of restricted distribution.
- 5.256 The primary pathway of effect would be through impacts to reens and ditches, and boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for affect associated with any works that impact hedgerows.
- 5.257 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Plants

- 5.258 The assessment site is of National value for plants of restricted distribution associated with aquatic habitats.
- 5.259 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels.
- 5.260 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure it is near-certain that there will be a negligible effect on this receptor during the construction phase.

Operational phase

- 5.261 During the operational phase, effects may arise from:
- maintenance;
 - changes in land-management. These can be positive, associated with changes in agricultural practices, and the creation of buffers to reens, ditches and hedgerows.
 - loss of habitat, habitat fragmentation and disturbance to valued receptors.
- 5.262 The potential for adverse impacts have been minimised as far as possible through the application of good practice techniques and adherence to well-designed method statements. These will be managed through the LEMP and are detailed as Primary (embedded) and Secondary mitigation.

Designated sites

Severn Estuary Ramsar

- 5.263 The proposed development is 1.3km to the north of the Severn Estuary Ramsar which is of International value.
- 5.264 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels which would impact European Eel populations. There is also potential for direct harm or injury, and the creation of barriers to their movement.

5.265 Improved water quality associated with changes in land management combined with protection of boundary habitats and ditch management plan make it near-certain that there will be a negligible effect on this receptor during the operational phase.

Gwent Levels – Redwick and Llandevenny SSSI

5.266 The proposed development is located within Gwent Levels – Redwick and Llandevenny SSSI which is of National (UK) value.

5.267 The primary pathway of effect would be through changes to adjacent land management affecting water quality. There will be no permanent habitat loss of interest feature habitats to the operational phase.

5.268 NRW have asked that the potential positive of poaching by cattle be included here as they can create egg laying sites for aquatic invertebrates. Current agricultural practices do not include wide-scale grazing by cattle, whilst reed edges are deep making them inaccessible, and ditches are largely overgrown. It unlikely that poaching is a regular occurrence here and no credible pathway of effect exists.

5.269 During the consultation process it has been agreed with NRW that a comprehensive ditch management program for the lifetime of the project will be enacted to ensure at least 50% of ditches associated with the two field compartments of the project area are in favourable condition, i.e. not categorised as double hedged, dry or hedged to one side and partially hedged to the other.

5.270 Improved water quality associated with changes in land management combined with protection of boundary habitats and the comprehensive ditch management plan make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Gwent Levels – Magor and Undy SSSI

5.271 The proposed development borders the Gwent Levels – Magor and Undy SSSI which is of National (UK) value.

5.272 The primary pathway of effect would be through changes to adjacent land management affecting water quality. There will be no permanent habitat loss of interest feature habitats to the operational phase.

5.273 Improved water quality associated with changes in land management make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Barecroft Fields SINC

5.274 The proposed development is adjacent to Barecroft Fields SINC which is of County (Monmouth) importance.

5.275 There is no likely primary pathway of effect.

5.276 Due to separation distance it is certain that there will be a negligible effect on this receptor during the operational phase.

Blackwall Lane Field SINC

5.277 The proposed development is adjacent to Blackwall Lane Field SINC which is of County (Newport) importance.

5.278 There is no likely primary pathway of effect.

5.279 Due to separation distance it is certain that there will be a negligible effect on this receptor during the operational phase.

Habitats

Coastal and floodplain grazing marsh

5.280 The proposed development is within an area of Coastal and floodplain grazing marsh of County importance.

5.281 The primary pathway of effect would be through direct habitat loss.

5.282 Solar panels are mounted on driven piles with an extremely small footprint. Invertors, the DNO substation and associated access tracks will result in the loss of 2.4ha of habitat. However, much of the habitat within the site is currently managed as arable.

5.283 Development will stabilise land use with the majority of the operational site managed with grazing or cutting. It is near certain that there will be a negligible effect on this receptor during the operational phase.

Intact hedge, species rich

5.284 Hedgerows associated with field boundaries are of Local value.

5.285 The primary pathway of effect would be through direct habitat loss.

5.286 The ditch management plan will not result in a loss in linear extent of this habitat.

5.287 Protection of boundary habitats make it near-certain that there will be a negligible effect on this receptor during the operational phase.

Reens

5.288 Reens are of County value.

5.289 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.

5.290 Improved water quality associated with reduced management pressures on 53ha of land that is currently an intensively managed grassland habitat and the creation of an additional 33ha of

grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Ditches

- 5.291 Ditches are of Local value.
- 5.292 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.
- 5.293 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of an additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats, and a comprehensive ditch management plan which will restore 5.8km of ditch habitat, this will make it certain that the development will have a moderate positive effect on this receptor for the period of its operation.

Amphibians, including Great Crested Newt

- 5.294 The assessment site is of Local value for common and widespread amphibians.
- 5.295 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. Buffer habitats to field boundaries will provide improved habitat and cover.
- 5.296 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of an additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Bats

- 5.297 The assessment site is of Local value for bats.
- 5.298 The primary pathway of effect would be through impacts to habitat features used by foraging bats, such as direct habitat loss and damage. The development will result in reduced management pressures on 53ha of intensively managed grassland habitat, with the creation of an additional 33ha of grassland habitats that is currently in arable rotation. Pastoral grazing of habitats beneath panels is likely to improve its value for foraging bats, whilst improved water quality within reens and ditches will result in increased numbers of prey items for bats.
- 5.299 No potential roosting habitats will be affected and there is negligible potential for disturbance, direct harm or injury.

5.300 Changes in land management and improved water quality associated with these changes and protection of boundary habitats make it is near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Otter

5.301 The assessment site is of Site value for Otter.

5.302 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, changes in water quality and water levels that could increase prey items such as amphibians and fish and lighting of the site at night. Habitat loss to the operational phase will not affect this receptor.

5.303 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats and no lighting of the operational site at nights, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Water Vole

5.304 The assessment site is of Local value for Water Vole.

5.305 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. Habitat loss to the operational phase will not affect this receptor.

5.306 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

European Eel

5.307 The assessment site is of County value for European Eel, whilst they are an interest feature of the Severn Estuary Ramsar and a sub-feature of the Severn Estuary SAC.

5.308 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. Habitat loss to the operational phase will not affect this receptor.

5.309 Improved water quality associated with reduced management pressures on 53ha of land that is currently an intensively managed grassland habitat and the creation of an additional 33ha of grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats and improved

ditch management, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Reptiles (Grass Snake)

- 5.310 The assessment site is of Local value for Grass Snake.
- 5.311 The primary pathway of effect would be through impacts to reens and ditches, and other boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels that may affect prey items.
- 5.312 Improved water quality associated with reduced management pressures on 53ha of land that is currently an intensively managed grassland habitat and the creation of an additional 33ha of grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats and improved ditch management, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Invertebrates

- 5.313 The assessment site is of National value for invertebrates of restricted distribution.
- 5.314 The primary pathway of effect would be through impacts to reens and ditches, and boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for affect associated with any works that impact hedgerows.
- 5.315 NRW have asked that the potential positive of poaching by cattle be included here as they can create egg laying sites for aquatic invertebrates. Current agricultural practices do not include wide-scale grazing by cattle, whilst reen edges are deep making them inaccessible, and ditches are largely overgrown. It unlikely that poaching is a regular occurrence here and no credible pathway of effect exists.
- 5.316 Improved water quality associated with reduced management pressures on 53ha of land that is currently an intensively managed grassland habitat and the creation of an additional 33ha of grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with creation of Shill Carder Bee habitat, a ditch management plan that will restore 5.8km of invertebrate habitat, and the protection of other boundary habitats, this will make it near-certain that the development will have a moderate positive effect on this receptor for the period of its operation.

Plants

- 5.317 The assessment site is of National value for plants of restricted distribution.
- 5.318 The primary pathway of effect would be through impacts to reens and ditches, and boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels.

5.319 Improved water quality associated with reduced management pressures on 53ha of land that is currently an intensively managed grassland habitat and the creation of an additional 33ha of grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the ditch management plan that will restore 5.8km of aquatic plant habitat, creation of buffer grasslands and protection of boundary habitats, this will make it near-certain that the development will have a moderate positive effect on this receptor for the period of its operation.

Decommissioning

5.320 After 35 years of operation it is likely that the site will be restored to its original condition. During decommissioning, the above ground infrastructure (solar panels and supports, substation, inverters, switchgear, CCTV & fencing) and the underground cabling will be removed from site. Tracks will be removed, unless the landowner wishes for them to be retained.

5.321 The site is to be reinstated to its former state and condition, as at the date of the lease. As such, the land will be returned to its original state - available and suitable for its current agricultural use.

5.322 The baseline for receptors assessed here are those present prior to the construction phase.

5.323 Decommissioning impacts will be assessed through updated habitat and species surveys prior to works to allow an informed assessment taking into account future wildlife legislation and guidelines and changes to the assessment site during its operational life. Mitigation will be designed on the basis of this future assessment.

Designated sites

5.324 Adverse effects on designated sites are unlikely during decommissioning. If an effect were to occur, it would be minor and short term, and would likely be associated with changes in water quality, water levels and temporary habitat loss.

Valued Habitats

5.325 Adverse effects on habitats are near-certain during decommissioning although they would likely be limited to terrestrial habitats. The primary pathway of effect would be through direct habitat loss and damage associated with compounds, storage areas and cable recovery.

5.326 It is near-certain that there will be a temporary loss of a small extent of valued habitat to the decommissioning phase. This negative effect would be minor, short term.

Notable species

5.327 Adverse effects on notable species are unlikely during decommissioning. However, it is likely that notable species legislation and guidance will change during the operational phase of the development and an updated assessment would be necessary prior to decommissioning.

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Table 5-10 Assessment of Effects

Receptor / resource	Phase	Sensitivity / value of receptor / resource	Nature of Potential Impact on receptor / resource	Secondary mitigation	Magnitude of potential impact	Level of effect, if relevant	Significant / not significant
Severn Estuary RAMSAR	Construction	International	Direct habitat loss and damage, and changes in water quality and water levels affecting European Eel	Exclusion zones to boundary features will be protected by a suitable fence. No night works will be completed.	Negligible		Not significant
Gwent Levels SSSI - Redwick and Llandeenny	Construction	National (United Kingdom)	Changes in water quality, water levels, and habitat loss. Dust deposition	Exclusion zones to boundary features will be delineated by a suitable fence. Damping down during dry periods	Negligible		Not significant
Gwent Levels SSSI - Magor and Undy SSSI	Construction	National (United Kingdom)	Changes in water quality, water levels, and habitat loss. Dust deposition	Exclusion zones to boundary features will be delineated by a suitable fence. Damping down during dry periods	Negligible		Not significant
Barecroft Fields SNCI	Construction	County (Newport)	Dust deposition	Damping down during dry periods	Negligible		Not significant
Blackwall Lane Field SNCI	Construction	County (Monmouth)	Dust deposition	Damping down during dry periods	Negligible		Not significant
Coastal and floodplain grazing marsh	Construction	County (Monmouth)	Habitat loss and damage	Following construction, bare areas will be restored by re-seeding. For the cable route, top and sub-soils will be stored separately and replaced in sequence following trenching and the route re-seeded	Minor	Adverse, temporary, short term	Not significant
Intact hedge, native species rich	Construction	Local	Habitat loss and damage	Exclusion zones to boundary features will be protected by a suitable fence.	Negligible		Not significant
Reens	Construction	County (Newport)	Habitat loss and damage	Exclusion zones to boundary features will be protected by a suitable fence. Damping down during dry periods	Negligible		Not significant

Table 5-10 Assessment of Effects

Receptor / resource	Phase	Sensitivity / value of receptor / resource	Nature of Potential Impact on receptor / resource	Secondary mitigation	Magnitude of potential impact	Level of effect, if relevant	Significant / not significant
Ditches	Construction	Local	Habitat loss and damage	Exclusion zones to boundary features will be protected by a suitable fence. Damping down during dry periods	Negligible		Not significant
Amphibians (common and widespread)	Construction	Local	Habitat loss and damage, and changes in water quality and water levels	Exclusion zones to boundary features will be protected by a suitable fence	Negligible		Not significant
Great Crested Newt	Construction	Local	Habitat loss and damage, and changes in water quality and water levels	Exclusion zones to boundary features will be protected by a suitable fence. Prior to works commencing in Fields 22 and 23 a suitable fence will be constructed at the reed/ditch buffer edge to ensure Great Crested Newts do not enter the construction site	Negligible		Not significant
Bats	Construction	Local	Habitat loss and damage	Exclusion zones to boundary features will be protected by a suitable fence. No night works will be completed.	Negligible		Not significant

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Table 5-10 Assessment of Effects

Receptor / resource	Phase	Sensitivity / value of receptor / resource	Nature of Potential Impact on receptor / resource	Secondary mitigation	Magnitude of potential impact	Level of effect, if relevant	Significant / not significant
Otter	Construction	Site	Habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.	Exclusion zones to boundary features will be protected by a suitable fence. No night works will be completed. Locations of HDD rigs will be informed by pre-construction surveys for Water Vole and Otter.	Negligible		Not significant
Water Vole	Construction	Local	Habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.	Exclusion zones to boundary features will be protected by a suitable fence. No night works will be completed. Locations of HDD rigs will be informed by pre-construction surveys for Water Vole and Otter	Negligible		Not significant
European Eel	Construction	County	Habitat loss and damage, and changes in water quality and water levels	Exclusion zones to boundary features will be protected by a suitable fence. Damping down during dry periods	Negligible		Not significant
Reptiles (Grass Snake)	Construction	Local	Habitat loss and damage, and changes in water quality and water levels that may affect prey items There is also potential for direct harm or injury.	Habitats with potential for Grass Snake likely will be de-vegetated prior to any site activities under the supervision of a suitably qualified ecologist. Exclusion zones to boundary features will be protected by a suitable fence.	Negligible		Not significant

Table 5-10 Assessment of Effects

Receptor / resource	Phase	Sensitivity / value of receptor / resource	Nature of Potential Impact on receptor / resource	Secondary mitigation	Magnitude of potential impact	Level of effect, if relevant	Significant / not significant
Invertebrates	Construction	National	Habitat loss and damage, and changes in water quality and water levels	Exclusion zones to boundary features will be protected by a suitable fence. Damping down during dry periods	Negligible		Not significant
Plants	Construction	National	Habitat loss and damage, and changes in water quality and water levels	Exclusion zones to boundary features will be protected by a suitable fence. Damping down during dry periods	Negligible		Not significant
Severn Estuary RAMSAR	Operation	International	Impacts to reens and ditches, changes in water quality and water levels which would impact European Eel populations	Protection of boundary habitats	Negligible		Not significant
Gwent Levels SSSI - Redwick and Llandeenny	Operation	National (United Kingdom)	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence. Comprehensive ditch management	Minor	Positive, long term	Not significant
Gwent Levels SSSI - Redwick And Llandeenny	Operation	National (United Kingdom)	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence.	Minor	Positive, long term	Not significant
Barecroft Fields SNCI	Operation	County (Newport)	None		Negligible		Not significant
Blackwall Lane Field SNCI	Operation	County (Monmouth)	None		Negligible		Not significant

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Table 5-10 Assessment of Effects

Receptor / resource	Phase	Sensitivity / value of receptor / resource	Nature of Potential Impact on receptor / resource	Secondary mitigation	Magnitude of potential impact	Level of effect, if relevant	Significant / not significant
Coastal and floodplain grazing marsh	Operation	County (Monmouth)	Direct habitat loss		Negligible		Not significant
Intact hedge, native species rich	Operation	Local	Direct loss of habitat extent	Exclusion zones to boundary features will be protected by a suitable fence	Negligible		Not significant
Reens	Operation	County (Newport)	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant
Ditches	Operation	Local	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence. Comprehensive ditch management	Moderate	Positive, long term	Not significant
Amphibians (common and widespread)	Operation	Local	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant
Great Crested Newt	Operation	Local	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant
Bats	Operation	Local	Improved foraging habitats	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant
Otter	Operation	Site	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant
Water Vole	Operation	County	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant
European Eel	Operation	County (Newport)	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant

Table 5-10 Assessment of Effects

Receptor / resource	Phase	Sensitivity / value of receptor / resource	Nature of Potential Impact on receptor / resource	Secondary mitigation	Magnitude of potential impact	Level of effect, if relevant	Significant / not significant
Reptiles (Grass Snake)	Operation	Local	Improved water quality with associated increases in prey items	Exclusion zones to boundary features will be protected by a suitable fence	Minor	Positive, long term	Not significant
Invertebrates	Operation	National	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence Comprehensive ditch management Creation of Shrill Carder bee habitat	Moderate	Positive, long term	Not significant
Plants	Operation	National	Improved water quality	Exclusion zones to boundary features will be protected by a suitable fence Comprehensive ditch management	Moderate	Positive, long term	Not significant

Enhancement

- 5.328 Enhancement is improved management of ecological features or provision of new ecological features, resulting in a net benefit to biodiversity, which is unrelated to a negative impact or is 'over and above' that required to mitigate/compensate for an impact.
- 5.329 Enhancement measures should be designed to deliver biodiversity objectives that are specified in relevant policy documents, and evidence should be provided to support the likelihood of delivering the predicted benefit. They should be incorporated into scheme design and assessed within the EclA. To ensure that enhancements are enduring, their delivery and management should normally be guaranteed through a legal obligation, such as, in England and Wales, a planning obligation under section 106 of the Town and Country Planning Act 1990, or its equivalent provision elsewhere.
- 5.330 To improve habitat quality Gwent Levels SSSI - Redwick and Llandeveyny, enhancement includes the removal of shading vegetation along 50% of ditches within Field Blocks 4 and 25 within the solar farm during the first 7 years of operation, with the field ditch cast and re-connected to the drainage system and managed for the operational period of the solar farm (Appendix 2.3 LEMP).
- 5.331 Approximately 7.7ha of buffer areas through the center of the site will be enhanced for Shril Carder Bee (Appendix 2.3 LEMP).
- 5.332 Ten woodcrete bat boxes will be fitted onto trees (Appendix 2.3 LEMP).
- 5.333 Grassland management within all buffer areas will create a more diverse sward through natural succession (Appendix 2.3 LEMP).
- 5.334 Areas of retained grassland and sown areas associated with the panels will be managed together after the first year. The intention is that areas beneath the panels will be grazed by sheep at suitable stocking levels (around 6-8 animals per ha), although this may change during the lifetime of the solar farm depending on changing agricultural practices and management.
- 5.335 Any large (>2m) gaps in hedgerows will be in-filled with native hedgerow species. This will comprise: shrubs and trees of local provenance and the species mix will reflect the mix within the adjacent hedgerow sections.

Monitoring

- 5.336 Monitoring will include aquatic habitats and aquatic invertebrates, Shril Carder Bee and water quality (Appendix 2.3 LEMP). Aquatic invertebrate and Shril Carder Bee surveys will follow the methodology adopted for this assessment. Water quality monitoring methodology will be agreed with Natural Resources Wales.

Delivery of mitigation and monitoring proposed

- 5.337 In line with Scoping Direction this ES provides reference to how the delivery of measures proposed to prevent/ minimise adverse effects is secured (through legal requirements or other suitably robust methods) and whether relevant consultees are aware of the measures proposed.
- 5.338 Mitigation, enhancement and monitoring is proposed for valued receptors. This is detailed within the LEMP (Appendix 2.3) and it is expected that this will be secured through a pre-commencement planning condition requiring the LEMP to be approved by NCC and NRW.

CUMULATIVE EFFECTS

- 5.339 Cumulative impacts are those additional changes caused by a proposed development in conjunction with similar developments, or as the combined effect of several developments taken together.
- 5.340 An assessment of the cumulative impact arising from the solar park development at this site requires that the relevant information relating to the individual impact of adjacent developments is available.
- 5.341 Approved developments that have the potential for a cumulative impact, and with sufficient data available within the public domain, are considered here.
- 5.342 Cumulative impacts arising from two or more developments may be:
- Additive - effects are summed
 - Antagonistic – the cumulative impacts are less than their summed values
 - Synergistic – the cumulative impact is greater than the summed impact.

NCC application 18/1109 Land Adjacent And North Of Branch Railway Line Seven Stiles Avenue Newport

- 5.343 The application description is: construction of 1.6km of rail formation in connection with the stabling of trains including associated engineering and landscape works.
- 5.344 No long-term impacts were predicted for designated sites. Impact was predicted for reptiles and great crested newt species, species which do not disperse over large distances during their lifecycle. Due to separation distances of greater than 5km, cumulative effect can be discounted.

Monmouthshire County Council application DM/2019/01937 Land At Vinegar Hill Vinegar Hill Undy Monmouthshire

- 5.345 The application description is: Hybrid planning application - Outline planning application for up to 155 dwellings, associated open space and infrastructure with all matters excluding access reserved, of which full planning permission is sought for 72 dwellings, associated open space and infrastructure.

5.346 Following adoption of mitigation, no significant impacts were predicted for statutory nature conservation sites, habitats or species. Cumulative effects are unlikely.

Monmouthshire County Council application DC/2016/00883 Rockfield Farm, The Elms, Undy, Caldicot, Monmouthshire, NP26 3EL

5.347 The application description is: Master planned development of 13.8 hectares of land for residential use and employment use; up to 266 Proposed residential units and approximately 5575 square meters of B1 floor space.

5.348 No formal assessment of impacts has been made. NRW have made no objection indicating that impacts on protected species and designated sites is unlikely. Cumulative effects are unlikely.

Monmouthshire County Council application DM/2018/01606 Rockfield Farm, The Elms, Undy, Caldicot, Monmouthshire, NP26 3EL

5.349 The application description is: Reserved matters application (pursuant to outline application) for the development of 144 dwellings and associated engineering works. | Rockfield Farm The Elms Undy Monmouthshire NP26 3EL.

5.350 No formal assessment of impacts has been made. NRW have made no objection indicating that impacts on protected species and designated sites is unlikely. Cumulative effects are unlikely.

Monmouthshire County Council application DM/2020/00103 Magor Brewery Newport Road Magor Caldicot

5.351 The application description is: Erection of sixteen fermentation vessels, enclosed supporting structure and external stairs; extension of existing high level access walkway; earth works; and temporary works including re-use of existing car park as vessel assembly site, creation of two temporary replacement car parks, temporary site roads and walkways, and associated works.

5.352 No formal assessment of impacts has been made and no NRW comments received. This project cannot be objectively taken into account in this assessment.

Conclusion

5.353 Cumulative impacts are unlikely.