LAND AT UPPER COSMESTON FARM, LAVERNOCK ROAD, PENARTH

ENVIRONMENTAL STATEMENT - ADDENDUM

VOLUME 2
CHAPTER 8: ECOLOGY

Replacement Chapter

8.0 ECOLOGY

INTRODUCTION

8.1.1 This chapter of the ES has been prepared by The Environmental Dimension partnership Ltd (EDP) and assesses the likely significant effects in respect of the proposed residential development at Land at Upper Cosmeston Farm, Lavernock Road, Penarth (hereafter referred to as "the EIA site") on Important Ecological Features (IEFs); including species populations, habitats and designated sites. The chapter forms a replacement to that submitted at Chapter 8 of the original Environmental Statement (ES) (submitted to the Vale of Glamorgan Council (VoGC) on 30th September 2020) and relates to the whole EIA site presenting additional information that was requested from internal and external consultees in respect of the planning application.

8.1.2 In brief, development proposals comprise the residential development with associated community facilities, including 1.0 hectare (ha) of land for the provision of a new primary school. The vast majority of the land within the EIA site is allocated for development within the Vale of Glamorgan Local Development Plan. The buildings of Lower Cosmeston Farm are situated outside the allocation in the Plan, but pre-application discussions with the Council have confirmed *in principle* agreement that they can be included within the planning application.

8.1.3 The chapter describes: the assessment methodology; the baseline conditions at the EIA site and surroundings; the likely significant environmental effects arising from development; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been employed.

8.1.4 The chapter is based upon the findings of a Preliminary Ecological Appraisal undertaken by Wardell Armstrong in 2016 in addition to their detailed survey work undertaken between 2016 and 2017 with respect to breeding birds, bats, dormouse, great crested newt and reptiles. This chapter also takes into account the findings of further update ecology survey work completed by The Environmental Dimension Partnership Ltd (EDP) during 2019 and 2022, the scope of which was devised in consultation with VoGC Ecologist Erica Dixon in 2019 and Colin Cheeseman in 2020 and 2021. The detailed findings of the ecological surveys undertaken of the EIA site are set out within **Technical Appendices 8.1-8.7**.

8.1.5 This chapter of the ES has been produced by competent experts from EDP, who are full members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have significant experience of Ecological Impact Assessment (EIA) for a range of schemes. This chapter has been prepared with reference to The CIEEM Ecological Impact Assessment Guidelines (2018).

ASSESSMENT METHODOLOGY AND SIGNIFICANC CRITERIA

Scope of the Assessment

8.2.2 The scope of the EIA has been determined by current ecological investigations of the EIA site. This included consultation with VoGC's Ecologists Erica Dixon during 2019 and Colin Cheeseman in 2021, and with Natural Resources Wales (NRW) in 2019.This process informed

the identification of Important Ecological Features (IEFs) pertinent to the proposals, and the likely scope of potential impacts on these receptors.

Extent of the Study Area

8.2.3 The field surveys undertaken to inform the assessment covered the EIA site boundary and, in some instances, adjacent habitats within Welsh Government's (WG) land ownership to provide contextual information and/or to ensure species populations were studied adequately.

8.2.4 Field surveys undertaken by Wardell Armstrong during 2016 initially covered land west of the former railway line only. The EIA site boundary was, however, extended during 2017, with update surveys undertaken to cover this additional area of proposed land take. These surveys included the field south of the Upper Cosmeston Farm Complex and Ty'r Orsaf Site of Interest for Nature Conservation (SINC), but these areas are no longer included within the current proposals for the development, lying outside the Red Line Boundary and therefore the scope of the EIA.

8.2.5 An ecological desk study, which encompassed the EIA site, was undertaken during February 2017 (see **Technical Appendix 8.1** for detailed scope and methodologies employed) and updated in January 2022. For the update assessment, a search radius of 10km from the EIA site boundary was employed for statutory designated sites of international importance and a 2km radius was employed for designated sites of national and local importance, as well as for protected/Priority species records. The search areas reflect the sensitivity and value of potential ecological receptors and are considered to be sufficient to cover the potential Zone of Influence (ZoI) [1] of the proposed development on these receptors while providing contextual information to assist with determining and evaluating the baseline.

8.2.6 The extent of the impact assessment has been defined as the ZoI, which has been determined through a review of the baseline ecological conditions relative to the emerging masterplan design and consideration of the proposed activities, as well as through liaison with other specialists involved in assessing the impacts of the proposed development as considered within the ES and other supporting documentation.

Collection of Baseline Information

8.2.7 The baseline ecology information collated by Wardell Armstrong during 2016 and 2017 for the EIA site and its surroundings is detailed within the Preliminary Ecological Appraisal Report and subsequent species-specific reports for bats, breeding birds, dormouse, great crested newt and reptiles as set out within **Appendices 8.1 – 8.6**. The updated baseline ecological information in respect of the potential of the EIA site collected by EDP during 2019 and 2022 is detailed within **Appendix 8.7 and 8.8.** The appendices detail the full methodologies employed, the subsequent findings and the implications for the proposed development. A summary of the relevant baseline investigations of the EIA site undertaken during 2016, 2017, 2019 and 2022 are provided below:

[1] Defined by CIEEM (2018) as being the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities.

i. A desk study in February 2017 involving the request for biodiversity information from South East Wales Biodiversity Records Centre (SEWBReC) for designated sites of nature conservation value and for records of protected and/or notable species in addition to a search of the Government's MAGIC website for additional designations (**Technical Appendix 8.1**). An update desk study was carried out in January 2022 (**Technical Appendix 8.8**);

ii. An Extended Phase 1 survey completed in September 2016 (**Technical Appendix 8.1**) followed by survey of additional land to the east of the disused railway line in April 2017. An update Extended Phase 1 survey was carried out in 0ctober 2021 and February 2022 (**Technical Appendix 8.8**);

iii. Detailed hedgerow assessment in accordance with the Hedgerow Regulations 1997, completed in September 2016 and April 2017 (**Technical Appendix 8.1**);

iv. A visual assessment of buildings/structures associated with Lower Cosmeston Farm and the wider EIA site for bat roosting potential, completed during September 2016 and updated in April 2017 (**Technical Appendix 8.1**) with further update surveys completed in July 2019 (**Technical Appendix 8.7**) and March 2022 (**Technical Appendix 8.8**);

v. A ground level visual assessment of onsite trees for bat roosting potential, completed during April 2019 (**Technical Appendix 8.7**) with further update surveys completed in March 2022 (**Technical Appendix 8.8**);

vi. Dusk emergence and dawn re-entry surveys of buildings/structures associated with Lower Cosmeston Farm and the wider EIA site, between May and September 2017, followed by update dusk emergence/dawn re-entry surveys of each building/structure within the EIA site during May and July 2019 and 2022 (**Technical Appendices 8.2,8.7** & **8.8**);

vii. Four dusk bat activity transect surveys completed between September 2016 and September 2017, including the deployment of one automated detector across the land ownership boundary for a minimum of five nights on four occasions between September 2016 and September 2017 (**Technical Appendix 8.2**), with further update surveys completed between May and July 2022;

viii. Badger walkover survey of the land ownership boundary during September 2016 with a further update survey in April 2017 (**Technical Appendix 8.1**), and February 2022 (**Technical Appendix 8.8**);

ix. Breeding bird surveys undertaken on four occasions between April and June 2017 (**Technical Appendix 8.3 - Report Confidential to protect location of breeding bird colonies**), with further update surveys carried out between April and June 2022 (**Technical Appendix 8.8**);

x. Dormouse nest tube surveys undertaken between May and October 2017 (**Technical Appendix 8.4**), with further update surveys carried out between April and September 2022;

xi. Pond habitat assessments and detailed pond surveys for protected and notable amphibians completed on six occasions between April and June 2017 (**Technical Appendix 8.5**), with further habitat assessments and eDNA surveys carried out in April 2022 (**Technical Appendix 8.8**); and

xii. Reptile surveys initially undertaken on four occasions during September 2016 with further surveys undertaken during May, June and September 2017 (**Technical Appendix 8.6**), with further update surveys carried out between April and September 2022.

Evaluation Methodology

8.2.8 The evaluation of IEFs has been made with reference to the guidelines published by the CIEEM in September 2018. The guidelines propose an approach to valuing features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being considered.

8.2.9 In addition, the following current best practice guidance in relation to survey techniques and mitigation measures have been taken into account:

i. Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;

ii. Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition;

iii. BTO/JNCC/RSPB Common Bird Census (CBC);

iv. Bird Monitoring Methods: A Manual of Techniques for Key UK Species;

v. Surveying Badgers;

vi. National Badger Survey: The history, distribution, status and habitat requirements of the Badger in Britain;

vii. The Dormouse Conservation Handbook;

viii. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*);

ix. Great Crested Newt Mitigation Guidelines; and

x. Froglife Advice Sheet 10: reptile survey.

Geographical Context

8.2.10 The Guidelines recommend that the value or potential value of an ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used:

i. International and European;

ii. National (Wales);

iii. Regional (South East Wales);

iv. County (Vale of Glamorgan); and

v. Local (Penarth).

Valuing Designated Sites

8.2.11 Within the UK, certain valued habitats have been assigned a level of nature conservation value through designation; and the Guidelines referred to above recommend that the reasons for this designation need to be taken into account in the assessment, such designations include:

i. Internationally important sites such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and RAMSAR sites;

ii. Nationally important sites such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs); and

iii. Regional/County/District important sites, which within VoGC are referred to as SINCs.

8.2.12 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Habitats

8.2.13 The Guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available, such as those listed on Annex 1 of the Habitats Directive, or those listed as habitats of principal importance under Section 7 of the Environment (Wales) Act 2016 or on the Vale of Glamorgan Local Biodiversity Action Plan. Where areas of a habitat or plant communities do not meet the necessary criteria for designation at a specific level, the Guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at the time of the assessment.

Valuing Species

8.2.14 The Guidelines require consideration of all protected species as 'important' features where there is the potential for a breach in legislation. Additionally, species should be assessed according to their biodiversity value, measured against published selection criteria where available (such as those listed on Annex 1 of the Habitats Directive, those listed as habitats of principal importance under Section 7 of the Environment (Wales) Act. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records, as well as their legal protection. The valuation of populations should make use of any relevant published evaluation criteria available at the time of assessment.

Characterising Potential Impacts

8.2.15 The Guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the ZoI that are expected to occur if the development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features.

8.2.16 The Guidelines recommend that the process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the zone of influence during the lifetime of the proposed residential development.

8.2.17 When describing changes/activities and impacts on ecosystem structure and function, reference should be made to the following parameters:

i. Positive or negative;

ii. Extent;

iii. Magnitude;

iv. Duration;

v. Timing;

vi. Frequency; and

vii. Reversibility.

8.2.18 In order to characterise the likely change and impact, it is necessary to take into account all the above parameters.

Significance Criteria

8.2.19 Legislation and policy guidance often require significant negative or positive impacts to be distinguished from others, although there is little guidance on how this distinction should be made. The Guidance defines an ecologically significant impact as an *"effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general"*.

8.2.20 Once a potential significant impact was identified as likely to affect the integrity/favourable conservation status of a potential IEF, the value of the receptor was then used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below the local level, or else deemed not to be significant, will be scoped out of the impact assessment.

8.2.21 Although certain species and habitats may not constitute IEFs based upon their nature conservation value they may still warrant consideration during the design and mitigation of the Proposed Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.

8.2.22 The significance of the potential impacts upon IEFs has been assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the proposals.

Consultation

8.2.23 The following statutory and non-statutory Consultees have been consulted to inform the impact assessment:

- Vale of Glamorgan Council (VoGC);
- Natural Resources Wales (NRW); and
- South East Wales Biological Recording Centre (SEWBReC).

8.2.24 The assessment work has been prepared with reference to these consultations.

Assumptions and Limitations

8.2.25 No further assumptions or limitations have been identified beyond those detailed within **Appendices 8.1 - 8.8** in relation to this technical assessment.

LEGISLATIVE AND PLANNING POLICY CONTEXT

8.3.1 In carrying out the ecological assessment of the proposed residential development, relevant international and national legislative instruments reflected in national, regional, county and local policies were reviewed. These included:

i. Planning Policy Wales, Edition 10, December 2018 (PPW) Chapter 5: Distinctive and Natural Places;

ii. PPW supplementary Technical Advice Note 5 (TAN 5): Nature Conservation and Planning;

iii. Vale of Glamorgan Local Development Plan (LDP) up to 2026 (adopted June 2017);

iv. Supplementary Planning Guidance (SPG) including Biodiversity and Development (April, 2018); and

v. Environment (Wales) Act 2016.

8.3.2 PPW and TAN5 set out particular policies in relation to the protection of biodiversity, green infrastructure, and geological conservation through the planning system. Such policies include those receiving statutory protection under existing legislative provisions and also those sites,

habitats and species out with such protection, thereby ensuring that the potential impacts of planning decisions on biodiversity, green infrastructure and geological conservation are fully considered.

8.3.3 Locally important sites such as Sites of Importance for Nature Conservation (SINCs) are non-statutory designations declared by VoG under the provision of the National Parks and Access to the Countryside Act 1949. This aims to bring sites of established nature conservation value into active management for the public and to protect them from development that would adversely affect their substantive nature conservation value.

8.3.4 *The Vale of Glamorgan Local Development Plan 2011-2026* (LDP)[2] sets out planning policy for the county up until 2026. The LDP includes Strategic Policy SP10 (Built and Natural Environment) which seeks to preserve and where appropriate enhance the built and natural environment and heritage of Vale of Glamorgan. The LDP also includes Managing Growth Policies 19 and 20 which seeks to avoid impacts on European and nationally protected sites respectively, unless the need for development is considered of overriding public interest; there is no satisfactory alternative and the actions undertaken by development will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range. In this instance, appreciate avoidance, mitigation and compensation measures will need to be secured.

8.3.5 In addition, Managing Growth Policy 21 concerns the protection of locally important sites such as SINCs as well as Regionally Important Geological and Geomorphological Sites (RIGGS) and priority habitats and species.

8.3.6 SINCs are non-statutory designations declared by VoGC under the provision of the National Parks and Access to the Countryside Act 1949. This aims to bring sites of established nature conservation value into active management for the public and to protect them from development that would adversely affect their substantive nature conservation value. In accordance with Policy MG21, development which has an unacceptable impact on SINCs will not be permitted unless; the need for the development clearly outweighs the nature conservation value of the site; adverse impacts on nature conservation and geological features can be avoided; appropriate and proportionate mitigation and compensation measures can be provided; and the development conserves and where possible enhances biodiversity interests.

8.3.7 Finally, Managing Development Policy 9 requires for development proposals to conserve and where appropriate enhance biodiversity interests with further guidance provided within SPG for Biodiversity and Development.

8.3.8 The WG is also required to ensure that its policies contribute to the conservation of the abundance and diversity of native wildlife and its habitats and minimise the adverse effects on wildlife where conflict of interest is unavoidable. In addition, the Wales Biodiversity Partnership was formed to guide and inform the biodiversity process in Wales, in fulfilment of its duty under Section 42 of the Natural Environment and Rural Committees (NERC) Act (2006) at that time. The Environment (Wales) Act has since become law in 2016, setting out a

[2] Vale of Glamorgan Council (2017). Local Development Plan Written Statement. Available at: https://www.valeofglamorgan.gov.uk/Documents/Living/Planning/Policy/LDP/LDP-Adoption/Adopted-LDP-Written-Statement-June-2017-final-interactive-web-version.pdf. [Accessed on 8 July 2019]

requirement for the sustainable management of natural resources necessary to build greater resilience into ecosystems, thereby providing a context for the delivery of multi-functional green infrastructure. Section 6 under Part 1 of this Act introduced an enhanced biodiversity and resilience of ecosystems duty for public authorities in the exercise of its function in relation to Wales. Additionally, Section 7 of this Act sets out a requirement for biodiversity lists of priority habitats and species of principle importance to conservation in Wales to be published and maintained, thereby replacing Section 42 of the NERC Act. Habitat Action Plans relevant to the EIA site include broadleaved, mixed and yew woodland, while Species Action Plans relevant to the EIA site include a number of bat species.

Wildlife Legislation

8.3.6 Animal and plant species that are considered to be threatened as a result of their rarity, vulnerability or persecution are afforded protection through both European and UK law. The Conservation of Habitats and Species Regulations 2017 protects a number of rare and vulnerable animal and plant species listed for protection in Europe, whilst the Wildlife and Countryside Act, 1981 (as amended by the Countryside and Rights of Way Act, 2000 and Natural Environment and Rural Communities Act 2006) affords protection to wild bird species requiring protection in Europe, and other rare or vulnerable native species of animals and plants, not protected under the Conservation of Habitats and Species Regulations 2017. In addition, the Animal Welfare Act 2006 further protects wild animals from unnecessary suffering when under the control of man and includes the Wild Mammals (Protection) Act 1996 which protects wild mammals from intentional cruelty and the Protection of Badgers Act 1992 which affords protection specifically to badgers.

8.3.7 Legislation also fully protects European Sites including SPA, SAC and RAMSAR sites which are recommended for designation by the Joint Nature Conservation Committee (JNCC). SSSIs of national importance, designated by Natural England under the Wildlife and Countryside Act 1981 (as amended), are also protected from any development that may destroy or adversely affect such sites, either directly or indirectly.

8.3.8 'Important' hedgerows, as defined in the Regulations are protected from removal (up-rooting or otherwise destroying) by the Hedgerow Regulations 1997.

Further Guidance

8.3.9 The approach taken in this assessment is made with reference to the guidelines published by the CIEEM in September 2018.

BASELINE CONDITIONS

8.4.1 This section sets out the baseline context of the proposed development and should be read in conjunction with **Appendices 8.1-8.8** where full methodologies and results of the ecological investigations are set out.

EIA Site Context

8.4.2 The proposed development is situated at approximate Ordnance Survey Grid Reference (OSGR) ST 17964 68945 within the LPA of VoGC and encompasses an area of approximately

25.2 hectares (ha) comprising a mixture of pasture and arable agriculture, the farm buildings of Lower Cosmeston Farm and the course of the disused railway route between Penarth and Sully, which dissects the EIA site at its centre from north to south. Field parcels within the EIA site are defined by a mixture of hedgerow boundaries and tree belts. Also passing through the EIA site is an agricultural-character track which connects the B4267 to the former Penarth Royal Observer Corps (ROC) Post, located adjacent to the EIA site's south-eastern corner.

8.4.3 The landform of the EIA site undulates between a low point of 14m above Ordnance Datum (aOD) at the EIA site's boundary with Lavernock Road and high point of 34m aOD at the southern boundary of the eastern half of the EIA site.

8.4.4 In terms of its wider context, the EIA site is bordered to the north by existing built form of Cosmeston, notably the residential streets of Upper Cosmeston Farm, Raven Way, Fulmar Close, Shearwater Close, Petrel Close, Whitcliffe Drive and Cosmeston Drive. To the west the EIA site is bordered by the course of the B4267 (Lavernock Road) which connects Cosmeston to the nearby settlement of Sully to the south-west and divides the EIA site from Cosmeston Lakes Country Park which is situated beyond to the north-west.

8.4.5 To the south of the EIA site the landscape is predominantly made up of arable agricultural land, with the village of Lavernock and its associated 'Holiday Village' located beyond the minor route of Fort Road. Ty'r Orsaf SINC is located immediately adjacent to the southeast boundary of the EIA site, and adjoins the section of dismantled railways within the boundary. Directly to the east of the EIA site runs the course of the Wales Coastal Path, along the length of the EIA Site's eastern boundary, before the land falls away as cliffs down to the Bristol Channel at Roundbush Rocks and Ranny Bay.

Designated Sites

Statutory Designations

8.4.6 The EIA site is not covered by any statutory designations; however, the Severn Estuary Ramsar/SAC/SPA/SSSI lies adjacent to the eastern boundary of the EIA site. There are, furthermore, an additional four SSSIs and one SPA located within 2km of the EIA site's boundaries, as summarised in **Table 8.1** and illustrated in **Technical Appendix 8.1.**

Table 8.1: Summary of statutory nature conservation designations within the EIA site's potential zone of influence.

Designation	Distance from EIA site (approx.)	Brief Description
International Designations within 2km		
Severn Estuary Ramsar Site	Adjacent to eastern boundary of EIA site.	The Severn Estuary is designated a Ramsar Site for: its immense tidal range; presence of unusual estuarine communities, reduced diversity and high productivity; populations of migratory fish; bird assemblages of international importance; and fish species associated with the whole estuarine and river system.

Designation	Distance from EIA site (approx.)	Brief Description
European Designations with 2km		
Severn Estuary SPA	Adjacent to eastern boundary of EIA site.	This SPA is designated for supporting populations of European importance, overwintering Bewick's swan (*Cygnus columbianus bewickii*) and migratory curlew (*Numenius arquata*), dunlin (*Calidris alpina*), pintail (*Anas acuta*), redshank (*Tringa tetanus*) and shelduck (*Tadorna tadorna*). The site also supports a population of European importance of passage ringed plover (*Charadrius hiaticula*) and is a wetland of international importance.
Severn Estuary SAC	Adjacent to eastern boundary of EIA site	This SAC is designated for its assemblage of Annex I habitats including: estuaries; mudflats and sandflats not covered by seawater at low tide; and Atlantic salt meadow. Also, a qualifying feature are its populations of twaite shad (*Allosa fallax*), sea lamprey (*Petromyzon marinus*) and river lamprey (*Lampetra fluviatilis*).
National Designations (Site of Special Scientific Interest (SSSI) within 2km		
Severn Estuary SSSI	Adjacent to eastern boundary of EIA site.	As above, the SSSI is of importance for its habitats, winter assemblage, fish and invertebrate populations.
Penarth Coast SSSI	Adjacent to eastern boundary of EIA site.	The site is principally designated for geological features. Included in the designation are species rich calcareous grassland and cliff-top scrub which support several plant species of limited occurrence and distribution in the area. The site contains Lavernock Point which is well known point for observing migratory birds.
Cosmeston Lakes SSSI	100m east	This SSSI comprises two lakes, created from flooded limestone quarries and support a range of submerged plants. The western lake is of special interest as the only known site in Wales for the presence of starry stonewort (*Nitellopsis obtusa*).
Cog Moors SSSI	1.74km north-west	Cog moors comprises a series of fields adjacent to Sully Brook and is of special interest for its large area of damp neutral semi-natural grassland. Of additional interest, Cog Moors supports populations of the nationally scarce bulbous foxtail (*Alopecurus bulbosus*) and pepper saxifrage (*Silaum silaus*). The site also supports species which are uncommon in Glamorgan including the brown sedge, adder's-tongue (*Ophioglossum vulgatum*) and green winged orchid (*Anacamptis morio*).
Sully Island SSSI	1.8km south-west	The site provides the main roost site for waders feeding in winter in the Taff/Ely estuary. The roost holds up to 100% of the dunlin, grey plover and ringed plover of the Taff/Ely and over 50% of the redshank and knot.
Local Nature Reserves (LNRs) within 2km		
Adjacent to western boundary of EIA site.	Adjacent to western boundary of EIA site.	Adjacent to western boundary of the EIA site.

Non-statutory Designations

8.4.7 The EIA site is not covered by any non-statutory designations; however, Ty'r Orsaf SINC lies directly adjacent to the south-west corner of the EIA site and comprises a section of the disused railway and field represented by species-rich neutral and calcareous grassland. Additionally, a further six SINCs are present within 2km of the EIA site, as summarised in **Table 8.2.**

Table 8.2: Summary of non-statutory nature conservation designations within the EIA site's potential zone of influence.

Designation	**Distance from EIA Site (approx.)**	**Brief Description**
Site of Importance for Nature Conservation (SINC) within 2km		
Ty'r Orsaf SINC	Adjacent to south-west corner of EIA site.	The site consists of a disused railway line that supports areas of species-rich neutral and calcareous grassland. The SINC was designated for the presence of Lowland Meadows, Lowland Calcareous Grassland and Mosaic Habitats.
Cosmeston Lakes SINC	200m west	Extensive country park supporting mosaic of habitats including species-rich calcareous and neutral grasslands, scrub, hedgerows, woodland, streams and ponds which all support a wide assemblage of species including many Section 7 Listed priority species.
Downs Wood SINC	500m north	Ancient and semi-natural woodland.
Lavernock Point East SINC	500m south	Site supports a mosaic of coastal species moderate to rich limestone grassland with scrub and is contiguous with Penarth SSSI.
Lavernock Point Wildlife Trust Reserve	600m south	Made up of a number of habitats including limestone grassland, scrub and oak coppice woodland supporting purple hairstreak butterfly (*Neozephyrus quercus*).
Cogan Pond SINC	1.2km north-west	Large pond supporting reedbed.
Cog Moors SINC	1.5km north-west	Series of species-rich rush pastures with neutral grassland and associated wet ditches.

Habitats

8.4.8 A full description of the habitats within the EIA site together with their associated plans illustrating the locations of these features assessed, is set out within **Appendix 8.1**, with update information provided in **Appendix 8.8**. In summary, the habitats found and described on and immediately adjacent to the EIA site include:

- Broadleaved woodland;
- Native hedgerows;
- Poor semi-improved and improved grassland;
- Amenity grassland;

- Tall ruderal vegetation and scrub;
- Dry ditch; and
- Buildings and hardstanding.

Broadleaved woodland

8.4.9 There are two linear strips of semi-natural broadleaved woodland that intersect the EIA Site which are joined in the south-west, and form part of the dismantled railway corridor that extends off-site. The species recorded include field maple (*Acer campestre*), sycamore (*Acer pseudoplatanus*), and ash (*Fraxinus excelsior*), with hawthorn (*Crataegus monogyna*) elder (*Sambuca nigra*) and birch (*Betula sp.*) with a few individual hazel (*Corylus avellana*) trees recorded. In addition, honeysuckle (*Lonicera periclymenum*) and clematis (*Clematis vitalba*) were recorded throughout the woodland. The ground flora comprised areas of dense ivy (*Hedera helix*), common nettle (*Urtica dioica*), cleaver (*Galium aparine*), Bramble (*Rubus fruticosus* agg.), with more open areas colonised by rosebay willowherb (*Chamerion angustifolium*).

8.4.10 Broadleaved woodland is listed as a Priority habitat and, furthermore, comprises suitable habitat for a diverse range of protected species. Broadleaved woodland is thus considered to be of Local Level importance.

Native hedgerows

8.4.11 The EIA site supports a predominantly mature and intact, hedgerow network. Hedgerows, whilst variable in height and width across the EIA site, are typically 5-8m tall and 1.5-2m wide with the majority left unmanaged. Of these, hedgerows H1, H3,H5, H6, H10, H14 were considered species-poor whilst hedgerow H12 and H13 were noted as defunct.

8.4.12 Hawthorn is typically dominant whilst other species identified include blackthorn *(Prunus spinosa),* dogwood *(Cornus sanguinea)* ash, elder, privet (*Ligustrum vulgare*) and bramble. The ground flora at the base of hedgerows is typically dominated by bramble, ivy and tall ruderal vegetation and species noted in the poor semi-improved grassland.

8.4.13 An intact species-rich hedgerow (H16) is present along the south-east boundary of the EIA site. The hedgerow is up to 3m high and shows signs of previous management. This was hawthorn dominant with blackthorn, dogwood, elder, hazel, field maple with nettle, ivy and false oat-grass (*Arrhenatherum elatius*) in the ground flora.

8.4.14 Of the hedgerows assessed,H16 is considered to be 'Important' in accordance with the Hedgerow Regulations 1997 Act; and qualifies as 'Important' due to the presence of protected species (i.e. dormouse) confirmed during the detailed surveys completed of the EIA site.

8.4.15 The quality of the hedgerow network present onsite, in addition to being a habitat of principle importance for Wales, qualifies this feature as an IEF of Local Level importance.

Poor semi-improved grassland

8.4.16 The fields surrounding the farm complex in the south-west of the EIA Site comprise poor semi-improved grassland used occasionally for grazing horses, with another area present immediately east of the dismantled railway line on the southern EIA site boundary. The majority of these areas are tall, rank, unmanaged grassland. Species composition of these areas is largely as described previously: Timothy (*Phleum pratense*), Yorkshire fog (*Holcus lunatus*), perennial rye-grass (*Lolium perenne)*, red clover (*Trifolium pratense*), and common fleabane (*Pulicaria dysenterica*). Common bent (*Agrostis capillaris*), sharp flowered rush (*Juncus acutiflorus*), crested dog's tail (*Cynosurus cristatus*), cock's-foot (*Dactylis glomerata*), ribwort plantain (*Plantago lanceolatum*) dandelion (*Taraxacum officinale*), creeping cinquefoil (*Potentilla reptans*) and broadleaved dock (*Rumex obtusifolius*) occur occasionally.

8.4.17 Species-poor, semi-improved neutral grassland habitat is not considered to be significant beyond a Site context.

Improved grassland

8.4.18 The three fields in the north-east of the EIA Site were previously described as being sown with arable crop, now comprise tall, rank and unmanaged improved grassland with scattered tall ruderal species. This area is assumed to have been recently re-seeded, despite the high diversity of species recorded. Grass species recorded include cock's foot, perennial rye-grass, Yorkshire fog, false oat-grass, timothy, Common bent, and crested dog's-tail. Forb species include groundsel (*Senecio vulgaris*), creeping buttercup (*Ranunculus repens*), and creeping thistle (*Cirsium arvense*).

8.4.19 The central field in the north of the site comprises improved grassland surrounded by broadleaved woodland on all sides. However, where previously the field has been used for horse grazing with dominant perennial rye grass, the area has since been left as a tall, rank, un-managed grassland with dominant cock's foot and abundant false oat-grass with a similar composition of forbs including sorrel species (*Rumex* sp*.),* dandelion, white clover (*Trifolium repens*), creeping buttercup and thistle and dock species occur occasionally.

8.4.20 Given the overall limited extent and low botanical diversity supported within areas of improved grassland habitat across the EIA site, such habitats are not considered to be significant beyond a Site context.

Amenity grassland

8.4.21 A small area of amenity grassland comprising the garden of the farmhouse is present onsite. The area is mown and surrounded by chain link fencing associated with a mature tree line to the north and east, an intact hedgerow (H5) to the north-west and mature leylandii hedgerow (H6) to the west. Species noted include ivy, broad-leaved dock, rosebay willowherb, hogweed (*Heracleum sphondylium*), common nettle, white clover, red clover, meadow grass species, fescue species (*Festuca sp*.), cock's foot, Yorkshire fog and perennial rye grass.

8.4.22 Given its small extent and limited floristic diversity, amenity grassland is considered to be of Negligible importance.

Tall ruderal vegetation and scrub

8.4.23 There are large patches of tall ruderal vegetation and scrub throughout the EIA site but most commonly found around the edges of field boundaries and along the dismantled railway corridor, with a linear patch present in the north-west of the EIA site. Tall ruderal species are also found scattered throughout the areas of rank grassland previously recorded as arable. Species noted include teasel (*Dipsacus fullonum*), hemp agrimony (*Eupatorium cannabinum*), rosebay willowherb (*Chamerion angustifolium*), creeping thistle, red clover, broad-leaved dock, ribwort plantain, wild carrot (*Daucus carota*), knapweed sp. (*Centaurea sp*.), perforate St John's-wort (*Hypericum perforatum*), common nettle, cock's foot and false-oat grass.

8.4.24 Dense continuous scrub is present in the north-east of the EIA site, where through a lack of management the western section of H14 has graded into a block of scrub. In the south-west corner where H8 was previously recorded, this now resembles scattered scrub adjoining the linear woodland associated with the dismantled railways. The species recorded within the scrub habitat include: hawthorn, blackthorn, elder, bramble, Buddleia (*Buddleja davidii*), and rose (Rosa sp.). Bramble scrub is also present on the field boundary along H10, and around the horse training arena in the south-west of the EIA Site.

8.4.25 Continuous and scattered scrub and tall ruderal vegetation present across the EIA site is not considered significant beyond a Site context.

Dry ditch

8.4.26 The presence of a dry ditch was recorded intersecting the fields in the south-west of the EIA site, which adjoins the off-site dry ditch previously recorded. Characteristics of this feature are contiguous with the adjoining ditch at approximately 1m deep and 0.5m wide. The ditch is sparsely vegetated supporting a similar species composition to that identified within the semi-improved grassland, suggesting this feature remains dry throughout most of the year, if not all year round.

8.4.27 Although such habitats provide a potential linear feature for the dispersal of protected species across the EIA site, given its poor condition and low botanical diversity this habitat is considered of Negligible importance.

Bare ground

8.4.28 A horse training arena is south-east of Lower Cosmeston Farm buildings, which is bedded with sand. Vegetation cover is limited here. The bare ground is of Negligible intrinsic ecological importance.

Hardstanding

8.4.29 Several areas of hardstanding are present, with a track joining the farmyard to the dismantled railway, with an area on the southern boundary currently used for highways equipment storage, which is bordered by bramble scrub and has some vegetative cover in the form of moss, perennial rye grass, teasel and other bare ground colonising species. This habitat is considered to be of Negligible importance.

Buildings and structures

8.4.30 There are 6 buildings within the EIA site boundary comprising the farmhouse, farm buildings and stables associated with Lower Cosmeston Farm (B1 and B3-7). Additionally, there are two disused railway bridges associated with the railway line running through the centre of the EIA site (B2 and B8).

8.4.31 Built structures present on and adjacent to the EIA site are considered to be of Negligible importance *per se*; however, their importance regarding their potential to support protected and/or notable species is considered further below in relation to species IEFs.

Designated Sites and Habitat IEFs

8.4.32 Those habitats considered to be IEFs and valued at or above Local level requiring consideration within this detailed assessment are summarised within **Table 8.3**.

Table 8.3 Summary of Habitat IEFs of Local or greater value requiring further consideration within the detailed assessment

Sensitive Receptor	Value	Relevant Policy/ Legislation	Location
Severn Estuary Ramsar/SAC/SPA/ SSSI	International	Conservation of Habitats and Species Regulations 2017; Planning Policy Wales (PPW) and Technical Advice Note 5 (TAN 5); and Policy MD 19 of the Adopted LDP.	Adjacent to eastern boundary of EIA site.
Penarth Coast SSSI	National	Conservation of Habitats and Species Regulations 2017; Wildlife & Countryside Act 1981 (as amended); Planning Policy Wales (PPW) and Technical Advice Note 5 (TAN 5); and Policy MD 20 of the Adopted LDP.	Adjacent to eastern boundary of EIA site.
Cosmeston Lakes SSSI &LNR	National		100m east
Cog Moors SSSI	National	Conservation of Habitats and Species Regulations 2017; Wildlife & Countryside Act 1981 (as amended); Planning Policy Wales (PPW) and Technical Advice Note 5 (TAN 5); and Policy MD 20 of the Adopted LDP.	1.74km north-west
Sully Island SSSI	National	Conservation of Habitats and Species Regulations 2017; Wildlife & Countryside Act 1981 (as amended); Planning Policy Wales (PPW) and Technical Advice Note 5 (TAN 5); and Policy MD 20 of the Adopted LDP.	1.8km south-west
Ty'r Orsaf SINC	County	Planning Policy Wales (PPW) and Technical Advice Note 5 (TAN 5); and Policies MD 9 & MG 21, of the Adopted LDP.	Adjacent to south east corner of EIA site.
Cog Moors SINC			1.5km north-west
Cogan Pond SINC			1.2km north-west

Sensitive Receptor	Value	Relevant Policy/ Legislation	Location
Cosmeston Lakes SINC			200m west
Downs Woods SINC			500m north
Lavernock Point East SINC & Lavernock Point Wildlife Trust Reserve			500-600m south
Broadleaved Woodland	Local	PPW and TAN 5; Policy MD9 of the Adopted LDP; and Habitat of Principle Importance for Wales, Environment (Wales) Act, 2016.	Two linear sections spanning north to south.
Native hedgerows			Throughout the EIA site.

8.4.33 The valued habitats noted above, together with other habitats within the EIA site of low or negligible intrinsic value, have also been found in some instances to support, or have the potential to support protected or notable species. This is discussed further within the 'Species' sub-sections below.

Protected and Priority Species

8.4.34 As set out previously, information on protected and/or notable species within or near to the EIA site was collected through a desk study and a range of field surveys. The findings of these investigations are set out in full in **Technical Appendices 8.1-8.8** and are summarised below.

Breeding Birds

8.4.35 Numerous records of birds were returned during the update desk study (**Technical Appendix 8.8**), several relating to Cosmeston Lakes (800m west) and Lavernock Point 9500m south). No records were returned from within the EIA site boundary for Schedule 1 listed species, but the habitats within the EIA site have the potential to support breeding for the following species recorded within 2km: barn owl (*Tyto alba*), hobby (*Falco subbuteo*), red kite (*Milvus milvus*) and Cetti's warbler (*Cettia cetti*).

8.4.36 More generally, the desk study returned numerous records for both red and amber listed Wales Birds of Conservation Concern (BoCC)[3] within a 2km radius of the EIA site. Records for red listed species of conservation concern include linnet (*Linaria cannabina*), whitethroat (*Curruca communis*), kestrel (*Falco tinnunculus*), willow warbler (*Phylloscopus trochilus*), bullfinch (*Pyrrhula pyrrhula*), herring gull (*Larus argentatus*), spotted flycatcher (*Muscicapa striata*), common gull (*Larus canus*), black-headed gull (*Chroicocephalus ridibundus*), starling (*Sturnus vulgaris*), greater black-backed gull (*Larus marinus*), whinchat (*Saxicola rubetra*), yellow wagtail (*Motacilla flava flavissima*), marsh tit (*Poecile palustris*), cuckoo (*Cuculus*

[3] Bladwell S, Noble DG, Taylor R, Cryer J, Galliford H, Hayhow DB, Kirby W, Smith D, Vanstone A, Wotton SR (2018) The state of birds in Wales 2018. The RSPB, BTO, NRW and WOS. RSPB Cymru, Cardiff

canorus) pied flycatcher (*Ficedula hypoleuca*), grasshopper warbler (*Locustella naevia*), and lapwing (*Vanellus vanellus*).

8.4.37 Records for amber listed species include skylark (*Alauda arvensis*), meadow pipit (*Anthus pratensis*), goldcrest (*Regulus regulus*), greenfinch (*Chloris chloris*), lesser redpoll (*Acanthis cabaret*), green woodpecker (*Picus viridis*), long-tailed tit (*Aegithlos caudatus*), house sparrow (*Passer domesticus*), mistle thrush (*Turdus viscivorus*), song thrush (*Turdus philomelos*), reed bunting (*Emberiza schoeniculus*), redstart (*Phoenicurus phoenicurus*), swift (*Apus apus*) and grey wagtail (*Motacilla cinerea*).

8.4.38 The hedgerow network in particular is considered to provide suitable breeding and foraging habitat for birds, in addition to areas of woodland associated with the disused railway line. Grassland fields supporting areas of improved/semi-improved grassland are considered less suitable for breeding more generally but may offer potential habitat for breeding skylark and other ground nesting birds, in addition to an abundance of foraging opportunities.

8.4.39 A total of 56 bird species were recorded during the breeding bird survey completed between April and June 2016 (Technical **Appendix 8.3**). Two species were confirmed breeding onsite, in addition to 28 species probably breeding and 10 species possibly breeding. Update surveys are being carried out between April and June 2022. If the findings differ significantly from 2017, the ES will be updated accordingly.

8.4.40 No Schedule 1 species were identified as breeding onsite, although peregrine was recorded foraging over the site in April, May and June 2017. Following a review of survey results against most recent literature, eight red listed species were recorded during the survey, including willow warbler (*Phylloscopus trochilus*), bullfinch (*Pyrrhula pyrrhula*), whitethroat (*Sylvia communis*) starling (*Sturnus vulgaris*) and linnet, all classed as probable breeders. Non-breeding herring gull (*Larus argentatus*), black-headed gull (*Chroicocephalus ridibundus*) and kestrel (*Falco tinnunculus*) were also present.

8.4.41 A total of twelve amber listed species were recorded during the survey including skylark, song thrush (*Turdus philomelos*), mistle thrush (*Turdus viscivorus*), greenfinch (*Chloris chloris*), long-tailed tit (*Aegithalos caudatus*), goldcrest (*Regulus regulus*), green woodpecker (*Picus viridis*) and house sparrow (*Passer domesticus*), all probable breeders. Non-breeding amber species recorded include shelduck (*Tadorna tadorna*), mallard (*Anas platyrhynchos*), lesser black-backed gull (*Larus fuscus*) and swift (*Apus apu*s).

8.4.42 Bird observations were found to primarily concentrate around the hedgerow network and treelines which typically supported general common species and garden variety birds. Of particular interest was the presence of six breeding warbler species within the hedgerows and scrub areas, comprising garden warbler (*Sylvia borin),* chiffchaff (*Phylloscopus collybita)*, blackcap (*Sylvia atricapilla),* whitethroat (*Sylvia communis),* willow and sedge warbler (*Acrocephalus schoenobaenus*). These species are listed as common breeding summer visitors locally by the Glamorgan Bird Club and whilst individually these species are not significant, the assemblage of six different warbler species present is notable and indicative of the diversity of habitat present.

8.4.43 Skylark (amber listed BoCC, common resident breeder) was the only BoCC recorded showing breeding evidence within the field interiors, with 1 displaying bird recorded. A pair of Amber

listed shelduck (common resident that breeds in small numbers at local estuaries) were recorded as low flyovers of the survey area in April and in May a single stock dove (locally common resident breeder) was recorded foraging in the fields before flying north.

8.4.44 Small but regular groups of gulls were recorded foraging in the fields, with maximum counts of five herring gull (red BoCC and common resident breeder), a single lesser black backed gull (amber BoCC and common resident breeder) and a great black backed gull (common resident, breeds in small numbers) recorded foraging within the fields in April. Regular flyovers of these three gull species were recorded throughout the survey period.

8.4.45 Swifts, swallows and house martins (all common breeding summer visitors) were regularly recorded foraging over the fields and farmsteads throughout the survey period, with swallows (max count of 14 in June – 1 colony comprising 5 pairs) and house martins (1 possible pair in association with the farm buildings) seen in association with the farm buildings. Swifts were only recorded as a foraging species.

8.4.46 A starling (red listed BoCC and common, but declining, resident breeder) was recorded singing from the farm buildings in May and observed carrying food into the buildings in June (1 pair) and regular foraging groups of starling were recorded within the paddock fields throughout the survey period. A house sparrow (amber listed BoCC and common resident breeder) breeding colony was also present within the farm buildings, and two other colonies were located around the peripheries of the survey area in association with the residential areas of Cosmeston, that border the northern boundary of the survey area.

8.4.47 Four raptor species were recorded during the BBS. These were buzzard (*Buteo buteo)* (green BoCC common resident breeder), sparrowhawk (*Accipiter nisus)* (green BoCC common resident breeder), kestrel (red BoCC common resident breeder) and peregrine falcon (Schedule 1, green BoCC, locally common resident breeder). None of these species were found to be breeding on site but were recorded frequently foraging or flying through/over the survey area.

8.4.48 The peregrine falcon record is most notable, being listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Peregrine were recorded regularly foraging over the survey area but are considered to be most likely breeding on the cliffs along the coastline outside of the survey area.

8.4.49 Overall the assemblage of bird species recorded onsite comprise relatively widespread and common species, with no Schedule 1 or red listed species noted to utilise the EIA site for breeding purposes. The EIA Site does, however, support the minimum assemblage of 'contributory species, to meet criteria for designation as a Wildlife Site and, therefore, must be considered of County Level Importance.

Bats

8.4.50 With respect to foraging and commuting bats, the desk study returned several records of bats within 2km of the EIA site including records for common pipistrelle (*Pipistrellus pipistrellus)*, Nathusius' pipistrelle (*Pipistrellus nathusii*), soprano pipistrelle (*Pipistrellus pygmaeus)*, noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*), lesser horseshoe and whiskered bat (*Myotis mystacinus)* within 2km of the EIA site.

8.4.51 With respect to roosting bats, the desk study returned records for lesser horseshoe (*Rhinolophus hipposideros*) bat roosts within a 6km radius of the EIA site, with the closest relating to a night roost approximately 3.5km north-west. In relation to other bat species, there are no records of roosts within 2km of the EIA site.

Bat Roost Assessment – Buildings

8.4.52 Lower Cosmeston Farm comprises a complex of buildings, including an occupied farmhouse and a number of agricultural barns. The EIA site also supports two old railway bridges located along the former railway line which crosses through the centre of the EIA site north to south.

8.4.53 The results of the update internal and/or external inspections of the buildings/structures located within the EIA site, undertaken by EDP in March 2022, are detailed at **Appendix 8.8** and summarised within **Table 8.4** below.

Table 8.4 Preliminary Building Inspection Results of Potential to Support Bat Roost, 2019.

Building ID	Description	Evidence of Bats/Potential Roost Features	Bat Roost Potential
B1	Two storey main farmhouse building with natural slate tiles and clay ridge tiles. Building located along the northern edge of the Lower Cosmeston Farm.	A number of roof slates and clay ridge tiles are raised or slipped providing numerous gaps, especially on the southern aspect, providing potential access points for bats. The walls are made of partly rendered brick and stone in good condition. The eaves are closed with a timber plate. There is a narrow gap running along the western gable end where the eve plates join the external wall render. The chimney which is well preserved with tightly fitted lead flashing. The roof valley is also fitted with lead with gaps between the lead and adjacent slate tiles. No internal access, No signs of bats were recorded.	High summer roosting and low hibernation potential.
B2	Bridge constructed from stone and brick.	The bridge is generally in good condition. Four crevices were recorded within the north west wing of the stone bridge. Some mature ivy on spandrel. No signs of bats were recorded.	Low summer roosting and hibernation potential
B3	A large two storey stone farm building with a pitch metal roof used for storing hay. There is a single storey stone pigsty with a pitch metal roof attached to the southern aspect of the main building.	The barn is made entirely from stone bricks. Mortar is in good condition apart from a few gaps (up to 4) visible internally. The roof is made of corrugated metal sheeting with access over the stone wall tops stone access opportunities underneath.. The windows and doors of the barn are open providing internal access. The timber lintels of the windows have gaps, which could be utilised by roosting bats. The barn has an open-sided stone extension on its south-eastern elevation with a pitched corrugated metal sheet roof and open window to the south.	Low summer roosting and hibernation potential. Confirmed summer day roost during 2017 and 2019.

Building ID	Description	Evidence of Bats/Potential Roost Features	Bat Roost Potential
		A sparrow colony were recorded nesting all along the ridge beam between the beam and the roof. One feral pigeon nest was recorded on top of the wall plate. No signs of bats were recorded.	
B4	Stone barn made of stone brick with a corrugated metal roof.. The extension on the eastern side is brick built, single storey with a flat roof.	Red brick surrounds the window and door frame. There is a gap running along the eves of south-western elevation enabling internal access. The windows and doors along the south-western elevation are closed or blocked, although access at apex of the circular window and behind the boards. The north-western gable end of the barn has a number of (up to 10) natural slate tiles installed along the bargeboard area which are slightly raised and providing access underneath. Damage to stone wall and quoin, with crevices leading deep within the fabric of the wall. The north-eastern elevation of the barn has a small single-story flat roof extension made of concrete and breezeblock. No access points recorded. Sparrow colony nesting in roof.	Moderate summer roosting and low hibernation potential. Confirmed summer day roost during 2017 and 2019.
B5	A stone farm building with pitch metal roof.	. The small stable block is made in style with the rest of the buildings. The walls are made of stone with the roof covered with corrugated composite sheeting. The roof is supported by timber beams. The windows and doors are open providing free access into the building. The internal walls of the barn are relatively intact, with several crevices where the mortar has failed. Three swallow nests recorded. No signs of bats were recorded.	Low summer roosting and low hibernation potential.
B6	A stone farm building with pitched metal roof.	The 1.5 storey stone barn with a pitched roof of metal sheeting which are overlapping the gable-end walls and creating crevices and potential internal access. The roof area is partly insulated with timber boards, which can provide a roosting space between the corrugated metal sheets and timber surface. The roof is supported with timber rafters which are in good condition. The main ridge rafter is double and therefore creating	Moderate summer roosting and low hibernation potential.

Building ID	Description	Evidence of Bats/Potential Roost Features	Bat Roost Potential
		roosting opportunities in connection with the roof. There is a metal lean-to constructed along the northern elevation of the barn. There is an open access leading internally providing opportunistic feeding and perching areas along the timber rafters supporting the roof. However, the stone and metal wall on the northern elevation has some crevices, there is a dense covering of ivy and scrub. There is a pitched extension on the northern elevation, of stone construction with metal roof. Six swallow nests were recorded throughout. No signs of bats were recorded in this building	
B7	Large triple ridged farm building. Stone building with pitched metal roof.	The barn is made of three separate compartments. The walls are made of corrugated metal sheeting; however, the ceiling is made of corrugated asbestos. The ceiling is supported by metal rafters. However, the front of the central compartment has sustained storm damage with the sheeting suspended by electrical wires, and the roof of the southern compartment has several small burn holes. No signs of bats were recorded in this building.	Low summer roosting and negligible hibernation potential. Confirmed summer day roost during 2019.
B8	North-eastern bridge. Principally stone bricks with small bricks in line of arch.	The bridge is made of brick which is in good condition. However, dense and mature ivy is overgrowing the bridge on both sides and providing some limited opportunities for roosting bats. Several small gaps in mortar were recorded in the arch, however, these were inspected and likely too small to provide shelter for a bat. No signs of bats were recorded.	Low summer roosting and negligible hibernation potential. Confirmed summer day roost during 2017 and 2019.

Dusk Emergence/Dawn Re-entry Surveys

8.4.54 During the emergence surveys of Lower Cosmeston Farm in June 2017 a single bat was observed which may have emerged from B3. The possible emergence was a common

pipistrelle at 21:57, approximately 33 minutes after sunset. A re-entry survey was subsequently undertaken on the building, during which no bats were observed re-entering. A common pipistrelle bat was, however, observed entering building B4 at 06:25 (6 minutes before sunrise) during a re-entry survey of an adjacent building (B7) in September 2017.

8.4.55 In addition, a common pipistrelle was observed which may have emerged from the north eastern bridge (B8) followed by extensive activity under the arch of the bridge during August 2017. Given the level of activity observed and the timings of the first bat recorded, a further re-entry survey was therefore undertaken at the bridge. No bats were observed re-entering the structure during this survey. No bats were observed emerging from or re-entering B1-B2, B4-B7 during either the emergence or the re-entry surveys.

8.4.56 The results of an update dusk emergence survey of all buildings/structures by EDP in 2019 are largely comparable to the results of previous surveys undertaken by Wardell Armstrong. During the dusk emergence surveys of Lower Cosmeston Farm in May 2019 three common pipistrelle bats were seen emerging from the open barn door of Building B3 at 21:26 followed by an emergence of a single common pipistrelle from the same building at 21:32.

8.4.57 On 15 May 2019, a possible emergence of a single common pipistrelle from B8 was recorded. Dense vegetation surrounding the bridge did, however, obscure activity. Results are, however, consistent with previous survey effort during 2017 where a possible common pipistrelle emergence was identified at this location.

8.4.58 In addition, two common pipistrelle bats were reported emerging from the north east facing elevation of building B7, specifically from gaps beneath metal sheathing along the roof line. This is in addition to emergence of a single common pipistrelle bat from the southern corner of the south west facing elevation and another two common pipistrelles from beneath the bargeboard at the base of the roof, with a potential emergence from features located more centrally.

8.4.59 During the dawn re-entry survey of building B7 during July 2019, three common pipistrelle bats were observed to re-enter the middle compartment of the barn through the open gates along the north-eastern elevation of the building. Based on the emergence and re-entry survey results as well as internal inspection of the building, it is highly likely that the bats are utilising crevices between timber rafters and asbestos sheeting of the roof.

8.4.60 No bats were seen emerging from Building B4 on 15 May 2019 compared to previous survey effort undertaken in 2017 where a possible emergence was recorded by Wardell Armstrong. However, the building inspection undertaken by EDP in July 2019 recorded low numbers (up to 5) of bat droppings being present within the central area.

8.4.61 Based on the above results, it is concluded that B3, B7 and B8 supports a summer day roost for low numbers of common pipistrelle bat with B7 supporting multiple features occupied by roosts. B4 is concluded to support an occasional day roost for *Pipistrelle* sp. bats.

8.4.62 More generally, foraging and commuting activity was recorded amongst the farm buildings as well as either side of each railway bridge. Activity was dominated by common and soprano (*Pipistrelle pygmaeus*) bats although Nathusius' pipistrelle (*Pipistrellus nathusii*), *Myotis* sp. and noctule (*Nyctalus noctula*) bats were recorded occasionally.

8.4.63 Common pipistrelle bat considered to be relatively widespread and common within Wales. Their roosts are considered to be of only low conservation significance in accordance with the Bat Mitigation Guidelines[4] given the small number of individuals supported.

8.4.64 Update surveys are being carried out between May and June 2022. If the findings differ significantly from 2019, the ES will be updated accordingly.

Bat Roost Assessment – Trees

8.4.65 A total of forty-two trees were assessed as having bat roosting potential, including twenty with high potential, twelve with medium potential and ten with low potential. The remaining trees were assessed as having negligible potential (**Appendix 8.7**). A summary of the findings of the initial ground level assessment is provided in **Table 8.5** below.

Table 8.5: The results of the ground level bat tree assessment undertaken by EDP on 1 February 2019.

Tree Number	Species	Potential Roost Features	Bat Roost Potential - Ground Level Assessment
G1	Group of hawthorn and ash	Dense ivy coverage, mature. Some limb holes and torn branches	Low
5	Ash	Multiple (5+) limb holes with a 2m lateral split, mature.	High
7	Ash	Several limb holes (3+) with flaking bark, mature.	High
8	Field Maple	Multiple (5+) limb holes, mature.	High
9	Field Maple	Rot hole present near cut branch, mature.	High
10	Field Maple	Several (2+) rot holes present, mature.	High
11	Field Maple	Woodpecker hole, several (3+) limb holes, rot hole and flaking bark present, mature.	High
12	Hawthorn	Three shallow limb holes with limited flaking bark, mature.	Medium
13	Field maple	Several (3+) deep limb holes, tear-out and flaking bark, mature.	High
14	Field maple	Several (3+) deep limb holes, rot hole and flaking bark, mature.	High
15 - 19	Field maple	Multiple (5+) deep limb holes, mature.	High

[4] Mitchell-Jones (2004). *Bat mitigation guidelines*. English Nature, Peterborough

Tree Number	Species	Potential Roost Features	Bat Roost Potential - Ground Level Assessment
20	Hawthorn	Overlapping limbs, mature.	Low
21	Hawthorn	Dense ivy, mature.	Medium
22	Elder	Single limb hole with some ivy, mature.	Medium
23	Field maple	Several (2+) limb holes, 2+ tear-outs, single lateral split, mature.	High
24	Hawthorn	Limb hole, ~1.5m high with dense ivy, mature.	Medium
25	Field maple	Several (3+) limb holes and a tear-out, mature.	No longer present
26	Hawthorn	Overlapping limbs and some ivy cover.	Low
G2	Group of 10+ trees, consisting of mature hawthorn and field maple	Limb holes, tear-outs, hollow trunk and over lapping limbs noted.	High
G3	Group of hawthorn	Dense structured group with dense ivy cover.	Low
29	Sycamore	Damaged limbs with multiple (4+) limb holes.	Medium
30	Ash	Tear out present with dense ivy.	Medium
31	Ash	Dense ivy.	Low
32	Field maple	Multiple (5+) splits.	High
33	Hawthorn	Dense ivy.	Medium
34	Hawthorn	Overlapping limbs.	Medium
35	Hawthorn	Dense ivy.	Low
36	Hawthorn	Dense ivy.	Low
37	Hawthorn	Single limb hole, overlapping limbs, split limb and flaking bark.	No longer present
38	Elder	Several (3+) limb holes, overlapping limbs, mature.	No longer present
39	Hawthorn	One large limb hole and three small limb holes.	No longer present
G4	Group of elder	Several holes and overlapping limb.	Low
41	Field maple	Single limb hole and overlapping limbs.	Medium
G5	Group of elder	Several (3+) limb holes.	Low

Foraging and Commuting *Bats*

8.4.66 Overall, the EIA site was confirmed to support relatively low levels of foraging and commuting activity, with particular concentrations of bat activity along woodland sections running north-

south through the centre of the EIA site, along the disused railway or otherwise hedgerow boundaries across the EIA site. In contrast, no activity was recorded along the south and western boundaries of the EIA site. Recorded activity was dominated by common pipistrelle and to a lesser extent soprano pipistrelle and noctule. Nathusius' pipistrelle was recorded on two occasions, once in spring 2017 and once in September 2017. On both occasions this species was recorded within the north-eastern corner of the EIA site. Myotis sp. was recorded on a single occasion during spring 2017 in association with woodland habitat.

8.4.67 The range and proportion of species/species groups recorded during the manual transect surveys was broadly similar to that described above with regards to the automated surveys. A minimum of five species were recorded during the manual transect surveys. Overall activity within the boundaries of the EIA site is dominated by soprano and common pipistrelle bats with occasional registrations of *Myotis* sp. bats and noctule. In addition, Leisler and Nathusius pipistrelle bats were recorded by automated bat detectors during autumn 2016 and spring 2017.

8.4.68 Update surveys are being carried out between May and September 2022. If the findings differ significantly from 2019, the ES will be updated accordingly.

Evaluation

8.4.69 An evaluation of the bat assemblage at the EIA site is provided below, with reference to the relative abundance and distribution of each bat species (with reference to the most up-to-date information on local and national species distribution[5,6] and population trends[7] available at the time of writing).

8.4.70 Common pipistrelle bats are common and widespread across the UK, representing the most and second most abundant species in the UK respectively. Whilst having suffered significant historic declines, national population monitoring[8] indicates that common pipistrelle bats are stable nationally and increasing. Common pipistrelle bat was found to be the dominant species utilising the EIA site during the activity surveys and was predominantly associated with woodland habitat. Only occasional foraging within the grassland fields themselves was noted during the surveys. Roosts of low conservation significance were also confirmed within buildings B3, B4 and B7 comprising Lower Cosmeston Farm as well as in association with the north eastern railway bridge (B8). Common pipistrelle bats using the EIA site are therefore considered to be of Local Level importance.

8.4.71 Soprano pipistrelle bats are widely distributed across the UK, and whilst populations declined dramatically in the twentieth century, field survey data show statistically significant population increases[9]. With only infrequent encounters typically associated with woodland habitat during the survey period, soprano pipistrelle bats supported by the EIA site are not considered to be significant beyond the Local Level.

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[5] Battersby. J. (Ed) & Tracking Mammals Partnership. (2005) *UK Mammals Species Status and Population Trends*. First Report by the Tracking Mammals Partnership. JNCC/Tracking Mammals Partnership, Peterborough

[6] http://monmouthshirebatgroup.org/Bats-in-Monmouthshire.php

[7] Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

[8] Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

[9] Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

8.4.72 Myotis bat species occur throughout most of the UK, their populations considered to be either stable or increasing in most cases[10]. Individuals of Myotis bats were infrequently recorded foraging and commuting across the EIA site throughout the survey period. The use of the EIA site by Myotis bat species is therefore considered to be of Local Level importance.

8.4.73 Noctule bat is widespread across the UK, with its population and range considered to remain stable in the UK[11]. Only a low number of noctule bats were recorded by surveyors and static detectors. Noctule bats using the EIA site are therefore considered to be of importance at the Local Level.

8.4.74 With respect to Leisler's bats, insufficient data is available to understand their current population trend, although this species is considered to be widespread albeit uncommon in Great Britain[12]. However, given the very low levels of activity recorded for this long-ranging species during the bat activity season, it is likely that the EIA site is used predominantly by commuting individuals. Leisler's bats supported by the EIA site are not considered to be significant beyond a site context.

8.4.75 With respect to Nathusius' pipistrelle, insufficient data is available to understand their current population trend. Overall, this species is considered rare in the UK but may be under recorded. Nathusius' pipistrelle was recorded during both manual transect and automated bat detector surveys undertaken in 2017, whilst registrations of this species were also recorded during update dusk emergence surveys undertaken in 2019. In consideration of its supposed rarity, these species is thus considered of Local Level importance.

8.4.76 The abundance and diversity of bat species recorded onsite is considered to be typical of an urban edge farmland site in Wales, with common and widespread generalist species such as common pipistrelle bats accounting for the vast majority of foraging and commuting activity recorded. Combined with the proximity of common pipistrelle day roosts in onsite buildings the overall bat assemblage utilising the EIA site is considered to be of Local Level Importance.

Badger

8.4.77 No records for badger setts or activity were returned by SEWBReC during the update desk study in 2022.

8.4.78 No evidence of badger was recorded during the update survey in October 2021 or February 2022. The woodland present along the dismantled railway corridor within the EIA site is still considered to have high suitability for badger commuting, foraging and sett building, and the un-managed grassland and network of hedgerows also offer suitable foraging and commuting opportunities. In the absence of active badger setts onsite, the EIA site is considered to be of Site Level importance to this species.

[10] Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017
[11] Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017
[12] Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

Dormouse

8.4.79 The update desk study returned four records of dormouse, three of which represent the survey results from the 2017 surveys carried out in relation to the EIA site. An additional record was also returned from 2017 and lies ~1600m north-west..

8.4.80 Evidence of dormouse, including nests and individuals, was recorded over the course of 2017 across 3 nest tubes. A dormouse individual was identified in nest tubes 68 and 69, deployed within woodland habitat associated with the disused railway whilst a nest was identified within nest tube 149, deployed within hedgerow habitat (H16) further east (Technical **Appendix 8.4**).

8.4.81 Potential dormouse nests were also recorded across the remainder of the EIA site. Given the density at which they occur, however, combined with the recorded structure of each nest (predominantly loose leaves with no substantial weaving), such nests are likely attributed to wood mouse (*Apodemus sylvaticus*), presence of which were also confirmed during survey effort.

8.4.82 Update surveys are being carried out between April and September 2022. If the findings differ significantly from 2017, the ES will be updated accordingly.

8.4.83 Dormouse populations are considered to be scattered across South Wales including within Vale of Glamorgan County Borough, existing at only low densities. The habitat within the EIA site provides suitable habitat to support dormouse. The linear woodland associated with the dismantled railway provides opportunities for foraging, commuting, hibernating, nesting and breeding for the species and the hedgerows provide further commuting and dispersal opportunities to the wider landscape. The majority of the hedgerows lack regular management and are 'leggy' and don't provide dense arboreal corridors and therefore have limited value for breeding and hibernation. The habitats within the EIA site are well connected to suitable habitat in the wider landscape. The on-site linear woodland and hedgerows are connected to a network of hedgerows and blocks of broadleaved woodland bordering parcels of arable land southwest of the EIA site. Lavernock Road is immediately west of the EIA site, and although a major road, this is bordered by suitable woodland, scrub and hedgerow habitat which could facilitate the commuting and dispersal of the species into suitable habitat west of the EIA site. The dormouse population on-site is considered to be of Local Level importance.

Otter and Water Vole

8.4.84 The update desk study returned no records for otter (*Lutra lutra*) within 2km of the EIA site within the last 10 years. With respect to water vole (*Arvicola* amphibius), the update desk study identified seven records of 10 individual water vole within 2km of the EIA site. The most recent record is from 2021, and the closest record is ~110m north-west recorded in a pond associated with Cosmeston Lakes Country Park, which is likely to be related to the reintroductions within the area that were identified in the previous assessment.

8.4.85 Nevertheless, there is no suitable habitat for ether species onsite or immediately adjacent such that both species are presumed absent. As such, the EIA site is considered to be of negligible importance to otter and water vole.

Great Crested Newt

8.4.86 A desk study assessment returned three records of great crested newt within 2km of the EIA site, comprising 17 individuals and eggs. The closest record is 1.7km west associated with a development at Swanbridge Road, and the most recent record is from 2018. Additionally, the Vale of Glamorgan County (VoGC) Ecologist has reported presence of great crested newt within Cosmeston Lakes, located ~300m north-west of the EIA site. (**Technical Appendix 8.5**).

8.4.87 During the 2017 desk study, ordnance survey and satellite mapping was used to gain contextual information and identify aquatic features within 500m of the site. A total of 23 waterbodies were identified within 500m of the EIA site, which warrants consideration of their potential to support great crested newt.

8.4.88 Twenty-six waterbodies (P1-P25) were assessed using the Habitat Suitability Index (HSI) Index (**Technical Appendix 8.5**) in April 2017 with P1, P5, P11, P14, P18, P18a, P21, P22, P23 and P25 subject to further detailed survey for this species in 2018.

8.4.89 The habitat suitability assessment confirmed P1, P5 and P15 to be of poor suitability, P14 and P20 to be of below average suitability, P11, 21 and P22 to be of average suitability, P18, P18a and P25 to be of good suitability and P23 to be of excellent suitability to support great crested newt. Waterbodies P2-4, P6-10, P12-13, P16 and P24 were dry at the time of survey and, therefore, excluded from further survey effort.

8.4.90 Waterbody P20 could not be accessed due to steep banks with mature scrub and grassland surrounding the pond. Waterbody 15 is a large lake also not considered suitable breeding habitat for GCN. Waterbody 22 was covered in duckweed and there was no access to the banks. Waterbodies 17 and 19 were streams and not considered to provide suitable breeding habitat for GCN. As such these ponds were also excluded from further survey.

8.4.91 Following completion of further detailed surveys of ponds comprising four visits during spring 2018 (**Technical Appendix 8.5**), no great crested newt were observed during the presence/absence surveys. This species is thus presumed absent from the EIA site, with the EIA site therefore considered to be of negligible importance to this species.

8.4.92 Update surveys are being carried out in April 2022. If the findings differ significantly from 2017, the ES will be updated accordingly.

Reptiles

8.4.93 Records for reptile species received during the desk study were limited to slow-worm, with 13 records from within the last 10 years. The closest record is ~270m south-west of the EIA site and the most recent record is from 2020.

8.4.94 During surveys undertaken across September 2016 and 2017 (**Technical Appendix 8.6**) a 'good' population of slow-worm was reported, with a maximum of seven adults recorded during any one survey. No grass snake, common lizard nor adder were recorded for the EIA site during the surveys. Observations of slow-worm were largely associated with grassy bank areas near the old railway bridge as well as field margins of the pony paddock.

8.4.95 Update surveys are being carried out between April and September 2022. If the findings differ significantly from 2017, the ES will be updated accordingly.

8.4.96 The EIA is considered to provide suitable habitat for common and widespread reptile species. The change in management of the previously arable fields and grasslands has improved these areas for reptiles, though these habitats are still representative of a very uniform-species poor sward that offers limited variety in relation to habitat for potential prey species. As well as the grasslands, the railway embankments, woodland edge, tall ruderal and scrub which provide basking, commuting, foraging and hibernating opportunities

8.4.97 Common reptiles including slow worm are considered to be widespread in the UK and in Wales. Given the low numbers of slow worm encountered within the EIA site, these species are considered to be of significance at the Local Level only.

Other Protected and Priority Species

8.4.98 Desk study records were returned for West European hedgehog (*Erinaceus europaeus*), with the closest record ~40m north of the EIA site, and common toad (*Bufo bufo*), recorded 100m away from the EIA site. Both species are of Principle Importance in Wales and are relatively widespread. Whilst suitable habitats exist onsite for these species, such habitats also predominate the wider landscape beyond. These species are therefore not considered to be significant beyond a Site context.

8.4.99 Additionally, the invasive species Japanese knotweed (*Fallopia japonica*)[13], is present along the northern boundary and on the southern boundary along the dismantled railway within the EIA site, as reported in **Technical Appendix 8.1 and 8.8**.

Species IEFs

8.4.100 Species identified as requiring consideration within the ES due to their identification as IEFs valued at or above Local level (with the exception of breeding birds, which are included for consideration due to legal implications) are summarised below in **Table 8.6**.

[13] As listed on Schedule 9, Part II, of the Wildlife and Countryside Act 1981 (as amended)

Table 8.6. Summary of species IEFs of Local or greater value requiring consideration within the detailed assessment

Sensitive Receptor	Value	Relevant Policy/ Legislation	Distance from Site
Breeding Bird Assemblage	County	Conservation of Habitats and Species Regulations 2017; Wildlife & Countryside Act 1981 (as amended); Planning Policy Wales (PPW) and Technical Advice Note 5 (TAN 5); Policies MG19, MG20 and MD 9 of the Adopted LDP; and S7 Species of Principle Importance, Environment (Wales) Act.	Onsite.
Dormouse	Local		Within hedgerow and woodland network onsite.
Roosting bats (common pipistrelle)			Onsite (Building B3, B4 & B7 at Lower Cosmeston Farm and the north-eastern railway bridge, B8).
Commuting and foraging bats (common pipistrelle, soprano pipistrelle, Myotid sp., noctule, Leisler's and Nathusius' bat)			Utilising woodland habitat and hedgerow network onsite.
Common reptiles (Slow worm)			Onsite - confined predominantly to field margins and woodland boundaries.

ASSESSMENT OF POTENTIAL IMPACTS

8.4.101 A full description of the proposed development and phasing is provided at **Chapter 5** of this ES. In summary, the proposals involve:

- Residential development with associated community facilities, public open space and play areas including the retention of circa 1.75 ha of the EIA site for the provision of a primary school;
- The creation and enhancement of pedestrian and cycle links throughout the EIA site connecting to the wider landscape;
- Landscaping (including re-grading) and sustainable drainage works; and
- Access/Infrastructure works.

8.4.102 To facilitate development the majority of hedgerows H4-H6, H10 and H12-H14 are proposed for loss the EIA site. The broadleaved woodland along the eastern boundary of the dismantled railway corridor (previously identified as H9), will be subject to fragmentation with a single break circa 24m wide proposed to accommodate the main spine road through. This is in addition to the partial loss of small sections of woodland habitat delineating the eastern and western boundaries of the improved grassland field to accommodate the proposed access road with additional erosion in the north of the EIA site. Total habitat loss amounts to circa 7,603 m^2.

8.4.103 An assessment of likely significant effects of the Proposed Development on the ecological features identified above has been undertaken based upon the Proposed Masterplan and Parameters Plan prepared for the EIA site which incorporates any inherent impact avoidance, minimisation and mitigation determined throughout the iterative assessment and design process. Those potential significant effects assessed include such inherent mitigation but, initially, in the absence of any other avoidance, mitigation and compensation measures.

8.4.104 Whilst exact details of the construction methods to be used cannot be determined with absolute certainty at this time, a number of assumptions and parameters have been fixed for the purposes of this assessment and are described fully within Chapter 5 – Project Description of this ES. Further details will be provided in a Construction and Environmental Management Plan (CEMP).

8.4.105 The key inherent mitigation measures included within the proposed development pertinent to the ecological impact assessment include:

- Retention of the vast majority of woodland and habitat associated with the western and eastern boundaries of the central improved grassland field, travelling north to south through the centre of the EIA site, with tree losses largely limited to a single section within each boundary to accommodate construction of a link road through the centre of the EIA site;

- Full retention and enhancement of shrub and scrub habitat, including the area colonising the 'old quarry, adjacent to the northern boundary of the EIA site;

- Retention and enhancement of the eastern boundary scrub and H16 adjacent to the coastal footpath;

- Buffering of woodland and hedgerow habitats retained within the EIA site amounting to circa 30,750m^2 combined with their enhancement and long-term management;

- The offsetting of the development footprint either side of retained hedgerows and vegetated boundaries onsite, with such buffers accommodating existing grassland habitat and retained hedgerows and trees, and further extended where necessary to accommodate root protection areas associated with mature tree standards and woodland edges as necessary. Such habitat corridors will be excluded from curtilage boundaries adjacent to minimise future mismanagement; and

- The siting of single-sided roadways, public footpaths and/or areas of formal public open space adjacent to sensitive habitats to be retained as far as possible to offset the development footprint away from areas of sensitive habitats retained adjacent, thereby minimising disturbance impacts whilst facilitating access for future maintenance.

8.4.106 The above is in addition to the creation of new hedgerow, tree and shrub habitats to maximise opportunities for protected species confirmed present onsite as far as possible and otherwise enhance the EIA site for wildlife in general, as follows:

- The provision of new tree, shrub and hedgerow planting amounting to circa 13,70013,700m^2 to compensate for habitat loss, particularly along the northern, eastern and southern boundaries of the EIA site to strengthen/widen the existing hedgerow resource or otherwise provide new habitat corridors along the southern peripheries of the EIA site;

- The inclusion of new infill planting across all internal and boundary hedgerows and woodland habitats to be retained onsite, utilising native species of local provenance, so as to further enhance and strengthen existing habitat corridors across the EIA site;

- The transplanting of suitable specimens of native, broadleaved trees and shrubs otherwise proposed for loss to suitable receptor sites located across the EIA site where appropriate, to close up existing gaps and speed up establishment of newly created habitats;

- The provision of areas of formal and informal green space encompassing meadow grassland, community orchards and allotments amounting to a total area of circa 19,800m^2 for wildlife and recreation;

- The provision of three sustainable drainage features within the north east corner, centrally in the south and in the south-west of the EIA site incorporating wet basins and planted with appropriate native wetland flora to maximise the availability of suitable terrestrial and aquatic habitat for amphibians, whilst also providing additional foraging habitat for a variety of bird and bat species. These wet drainage features will comprise attenuation ponds and/or reedbeds within green open space ;

- The provision of suitable drainage feature incorporating swales and reed beds throughout the remainder of the development (equating to 24,100m^2), planted with appropriate native wetland flora to maximise the availability of suitable terrestrial and aquatic habitat for amphibians, whilst also providing additional foraging habitat for a variety of bird and bat species;

- The enhancement of grassland habitats to be created/enhanced within the south of the EIA site. Enhancement measures proposed include supplementary seeding and/or use of green where appropriate, together with the implementation of sensitive management measures, so as to provide structurally diverse and species-rich grassland habitats, maintained in the long term for the benefit of wildlife;

- The exclusion of all retained, enhanced and newly created habitat from adjacent curtilages, with such habitats subject to a sensitive management and maintenance regime in the long term; and

- The provision of an extensive network of formal public open space to reduce recreational impacts upon statutory and non-statutory designated sites and other sensitive habitats adjacent, in addition to the provision of formal landscaping and tree planting across the development footprint itself.

8.4.107 The above inherent mitigation measures are illustrated within the Proposed Masterplan and Parameters Plan - Green Infrastructure submitted within this ES.

Potential Construction and Operational Significant Effects

8.4.108 Development of the site includes two main stages, namely the construction phase comprising all site preparation works and construction of all buildings, associated infrastructure and landscaping, and the operational phase comprising the long-term occupation of the EIA site. The effects of the proposals in relation to these two stages are discussed in turn below.

8.4.109 A potential third, decommissioning, phase has not been given further consideration due to the nature of the proposed development.

Construction Effects

8.4.110 Construction is proposed to span approximately 7 years from 2022 to 2029 and over a number of phases as described within Chapter 5 of this ES. Potential significant effects identified which could arise as a result in the absence of mitigation include the following:

- Effects of direct habitat loss due to land take upon habitats and species;
- Indirect effects to designated sites, habitats and species due to habitat degradation and damage;
- Effects of light, noise and human disturbance to habitats and species;
- Increased risk of collision to species; and
- Pollution of groundwater and surface water flows.

Statutory Designations

8.4.111 VoG's Adopted Local Development Plan was subject to a Habitat Regulation Assessment (HRA) in 2013[14] which considered the likely significant effects to arise through policies inherent within the LDP including Policy MG2 (Housing Allocations) on European sites within the zone of influence. Such designations include, by virtue of their proximity and connectivity to the EIA site the Severn Estuary Ramsar Site, SAC, SPA and Ramsar.

8.4.112 In particular, screening of site allocations which includes development of the EIA site identified four main areas of impact arising that may have potential for significant effects on the integrity of designated sites within the EIA site's ZoI. These four main areas are:

[14] Vale of Glamorgan Council/Enfusion (2013) Habitats Regulations Assessment (Appropriate Assessment) Report. Available at: https://www.valeofglamorgan.gov.uk/Documents/Living/Planning/Policy/LDP/Examination-Documents-2015/SD11%20-%20Habitats%20Regulations%20Assessment%20-%20Appropriate%20Assessment%20Report%20of%20Deposit%20LDP%20(September%202013).pdf [Accessed on 8 July 2019]

- Water Resources - resulting from increased demand for water consumption arising from new residential and employment developments;

- Water quality - Resulting from increased discharge requirements arising from new residential and employment developments and the potential for increased point source pollution, changes to surface water/run-off;

- Atmospheric Pollution - arising from a growth in airborne and surface transport as well as general development (emissions from construction/ building stock); and

- Disturbance - predominantly as a result increased recreational activity arising from new residential and employment developments.

8.4.113 Subsequently an Appropriate Assessment (AA) was undertaken to determine if there is the potential for the LDP to have adverse in combination effects on the integrity of the identified European sites. The significance of these impacts is dependent to some extent on the location of proposed development.

8.4.114 The screening found that for the majority of site allocations there were no pathways for development to have direct impacts on European sites, given the distance of the allocations from designated habitats and species, and the lack of connectivity between the development and the potential receptors. Although the EIA site is located adjacent to the Severn Estuary Ramsar/SAC/SPA, an AA concluded that development will not result in any direct impacts given the EIA site is raised on a headland above the Severn Estuary. There remains, however, the potential for indirect impacts on the Severn Estuary through increased recreational pressure, atmospheric pollution, pressure on sewerage capacity and surface run-off. However, mitigation contained within the LDP policies seek to protect biodiversity and minimise the impact of development on the environment, thus negating the potential for negative effects to occur.

8.4.115 Nevertheless, the EIA site still requires consideration at the project level particularly given that an HRA and AA of allocated development at Upper Cosmeston Farm was based on an allocation of only 235 dwellings.

8.4.116 Impacts to the Severn Estuary Ramsar/SAC/SPA associated with a deterioration in water quality and increase in suspended solids could occur during the construction phase, as a result of the discharge of contaminated run-off. Pollution incidents could also arise as a result of leaks and spills from construction activities, resulting in the introduction of hydrocarbons and other contaminants from site plant or of sediment loads arising from dust deposition or spoil movement. An increase in construction traffic may, further, result in a deterioration in air quality with increased disposition of pollutants across sensitive habitats. Further details are provided in Chapter 11 of this ES.

8.4.117 Whilst it is not possible to predict accurately the full ecological impact of a contamination/pollution event occurring onsite given that its scale and extent cannot be predicted, in the absence of mitigation negative effects are considered possible. Any unmitigated impact could lead to negative impacts which are considered to be temporary and reversible. Whilst the Severn Estuary is valued at International level, given the small scale and

extent of anticipated impacts, along with the spatial separation of the sites, such potential effects are considered to be significant at local level only**.**

8.4.118 Similar impacts may also arise with respect to those SSSIs identified above, including the Severn Estuary SSSI and Cosmeston Lakes SSSI and LNR. Subject to implementation of the same mitigation required in respect of international and European designated sites, however, no significant impacts are considered likely to arise.

8.4.119 With respect to other statutory designates sites detailed in Table 8.1 above, given their distance and spatial separation from the EIA site, no significant impacts are considered likely to arise. Other national designations have therefore been scoped out of this assessment accordingly.

Non-Statutory Designations

8.4.120 Similar to that reported above, impacts to the Cosmeston Lakes SINC during the construction phase could potentially arise as a result of contamination/pollution incidents. The unmitigated effects upon the SINC can be characterised as a negative impact, anticipated to be temporary and reversible. Whilst the designation is valued at County level, given the small scale and extent of anticipated impacts, such effects are considered to be significant at the local level only.

8.4.121 The Ty'r Orsaf SINC is located directly adjacent to the south-west corner of the EIA site. There is, therefore, the potential for physical damage and/or indirect degradation of SINC boundary features to occur during construction given the proximity of built development and/or proposed landscaping works. Retained woodland and trees associated the boundaries of this SINC may be further subject to indirect impacts, such as soil compaction, erosion and pollution. In the absence of mitigation, the extent and magnitude of such, medium-term, potentially frequent impacts (i.e. duration of the construction phase), is likely to be relatively minor owing to such habitat being restricted to SINC boundaries albeit the effects could be permanent and potentially irreversible. The significance of such adverse effects upon SINC habitats is considered to be of local significance.

Habitats

8.4.122 The proposed development layout has sought to minimise such impacts as far as possible through confining losses primarily to the interiors of arable and improved/poor semi-improved grassland fields of generally low botanical interest.

8.4.123 However, the majority of hedgerows H4-6, H10 and H12-H14 and are proposed for loss whilst the broadleaved woodland on the eastern boundary of the dismantled railway line will be subject to fragmentation with a single break circa 24m wide proposed to accommodate the main spine road through the EIA site. This is in addition to the partial loss of small sections of woodland habitat delineating the eastern and western boundaries of the improved grassland field to accommodate the proposed access road with additional erosion in the north of the EIA site.

8.4.124 The proposed development has, however, been designed to incorporate the hedgerow and tree network as far as possible with losses predominantly confined to habitats of relatively low ecological importance. Indeed, hedgerows H5-H6, comprise short sections of hedgerow

forming the curtilage of farmhouse, and along with H4, are fragmented from the wider hedgerow network. 'Important' hedgerowH16 within the EIA site boundary is proposed for retention with enough flexibility in the masterplan design to offset the development footprint from these features by through retention, enhancement and creation of suitable habitat buffers.

8.4.125 With respect to woodland, habitat loss has been minimised through the sensitive location of road and footpath links to exploit natural gaps or existing tracks/footpaths through the vegetation.

8.4.126 Moreover, inherent mitigation to include the provision of, tree, hedgerow and shrub planting, in addition to new proposed infill along the eastern and southern site boundaries, is considered to adequately compensate for such losses. Nevertheless, loss and fragmentation of habitat including hedgerows and woodland valued at the local level is characterised as a negative, permanent and irreversible effect. However, given the small scale and extent of the anticipated impacts, combined with the level of inherent mitigation, such effects are considered to be of only **Local** significance.

8.4.127 In addition to direct habitat loss, retained hedgerows, trees and woodland may be subject to indirect degradation impacts, such as soil compaction, damage to root protection zones and encroachment by machinery from adjacent construction works. In the absence of mitigation, the extent and magnitude of such, medium-term, potentially frequent impacts (i.e. duration of the construction phase), is likely to be negative, permanent and potentially irreversible. The significance of such effects upon notable features is considered to be of **Local** significance.

8.4.128 Indirect effects associated with increased levels of disturbance, will likely occur during the construction phase through the use of lighting and increased levels of vehicular traffic, machinery use and plant movement. Such disturbances arising can be intermittent, frequent, and/or constant throughout the construction period. Given that the majority of the works will be undertaken during daylight hours, the usage of artificial lighting will likely be limited to the early morning and early evening hours, with greater requirements for artificial lighting during the winter months. This could potentially impact upon the woodland, hedgerows and the species using it (see below). The proposed development has, however, been designed to protect such habitats from the development footprint as far as possible, offsetting from such features through retention, enhancement and creation of suitable habitat buffers. Disturbance impacts on adjacent semi-natural broadleaved woodland and native hedgerows are considered to be negative**,** temporary and reversible at the site level. The significance of such effects upon notable features is considered to be of **Local** significance.

Species IEFs

Birds

8.4.129 The loss and degradation of potential bird nesting habitats during construction will primarily be restricted to species-poor hedgerows, small sections of woodland and buildings associated with Lower Cosmeston Farm. In respect of the magnitude of habitat loss and degradation combined with the importance of a breeding bird assemblage onsite, such impacts are considered negative, permanent, irreversible and of significance at the **Site** level.

8.4.130 The legal protection afforded to birds at the nest (their eggs and young) is considered inherent mitigation to ensure no effects relating to direct harm/injury arise in respect of the breeding bird assemblage. Therefore, negligible impact is predicted.

8.4.131 In the absence of mitigation, disturbance of nesting and foraging habitat for the breeding bird assemblage through light spill, noise, visual and human disturbance during construction could potentially occur. Nesting birds sensitive to such disturbance could abandon nests and breeding territories and become displaced from other populations. Birds will be most sensitive to noise and visual disturbance occurring in the vicinity of habitats during the breeding bird season, though will likely return to such suitable habitat upon cessation of such disturbances. In absence of mitigation, negative effects arising from visual/noise/human disturbance during the construction phase upon birds are considered temporary, reversible and of **Site** level significance only.

Bats

8.4.132 With respect to buildings present within the EIA site, update dusk emergence/dawn re-entry surveys undertaken by EDP identified a low status day roost for common pipistrelle bat in buildings B3, B4, B7 and B8.

8.4.133 B3, B4 and B7, associated with Lower Cosmeston Farm, will be demolished to facilitate redevelopment of the EIA site resulting in loss of three low status common pipistrelle bat roosts of local importance. B8 (the north eastern railway bridge) will be retained. Such impacts are considered significant negative, permanent and irreversible, and of **Local** level significance.

8.4.134 With respect to remaining buildings/structures onsite (B1-2, B5-6), although several were considered to have low-moderate potential to support roosting bats following a visual assessment undertaken by Wardell Armstrong in 2016 and 2017. Update dusk emergence/dawn re-entry surveys during 2019 found no evidence of roosting bats within remain buildings/structures, such that no direct impacts associated with their loss will arise and/or disturbance will arise.

8.4.135 Development will result in the loss of several trees and tree groups across the EIA site including T5, T7-T11, and T13-T19 with high potential to support roosting bats, T12 with moderate potential and G1 and T35-T36 with low potential to support roosting bats. Further detailed inspection of such trees to confirm presence/likely absence of a roost will, however, be undertaken prior to their removal. Where no roosting or evidence of roosting bats are identified such direct impacts are considered unlikely. Due to the transitory nature of this species group; however, a roost may establish itself at a later date in which case negative, permanent and irreversible effects associated with the loss of tree roosts and subsequent harm/injury of bats may arise, with such impacts considered of **Site** level significance.

8.4.136 Manual transect and automated bat activity surveys have confirmed that the EIA site supports low levels of foraging and commuting activity dominated by common and widespread bat species considered to be of local importance.

8.4.137 Habitats considered most important to a local bat assemblage, including hedgerow boundaries and broadleaved woodland will largely be retained and buffered from the development footprint with losses confined to internal hedgerows which are predominantly

defunct and/or fragmented from the wider landscape, and woodland sections required to accommodate access roads. In contrast, improved and poor semi-improved grassland of low botanical interest is considered to be of limited importance as a foraging resource to a local bat assemblage. Such losses can, however, have a detrimental impact upon the local bat assemblage's ability to move across the landscape whist reducing the availability of foraging habitat across the EIA site. In the absence of mitigation, loss and fragmentation of suitable habitat are considered to be of **Local** level significance and will have a negative, permanent and irreversible effect on the bat assemblage.

8.4.138 With respect to those habitat features to be retained, degradation through damage and disturbance during the construction phase could result in the further loss of roosting and breeding sites in addition to habitat important for foraging, dispersal and migration. In the absence of mitigation, the effects of such impacts upon bats are considered to be negative, permanent and potentially irreversible. The significance of such effects upon these species is considered to be of **Local** level significance.

8.4.139 Indirect disturbance (particularly light spill) upon potential tree roosts and commuting/foraging habitat may arise during construction. Such impacts can affect species through their physiology (such as through increased heart rates, metabolism and stress), and through their behaviour (such as through forced dispersal and/or displacement). Impacts could result in the abandonment of roosts, foraging territories and of commuting and dispersal corridors, which could significantly affect those species supported by the EIA site. Such disturbances arising can be intermittent, frequent, and/or constant throughout the construction period. However, given that the majority of the works will be undertaken during daylight hours, the usage of artificial lighting will likely be limited to the early morning and early evening hours, with greater requirements for artificial lighting during the winter months. Overall, potentially negative effects arising from indirect disturbance upon the local bat assemblage, although minor and temporary, are considered to be a significant at the **Site** level only.

8.4.140 In addition, increased amounts of traffic movements by vehicles, machinery and plant throughout the construction phase could increase the potential risk of road casualties upon the local bat assemblage, particularly when construction access roads and removing vegetation across which species disperse and forage. However, given that such impacts will most likely be confined to daylight hours, with bats active at night, no significant negative effects are considered likely to arise.

Dormouse

8.4.141 With respect to suitable dormouse habitat, the majority of hedgerows H4-6, H10 and H12-H14 and associated mature tree standards is proposed for loss whilst the broadleaved woodland on the east of the dismantled railway will be subject to fragmentation with a single break circa 24m wide proposed to accommodate the main spine road through the EIA site. This is in addition to the partial loss of small sections of woodland habitat delineating the eastern and western boundaries of the improved grassland field to accommodate the proposed access road with additional erosion in the north of the EIA site.

8.4.142 The proposed development has, however, been designed to incorporate the hedgerow and tree network as far as possible with losses predominantly confined to habitats of relatively low ecological importance. Indeed, hedgerows H5-H6, comprise short sections of hedgerow

forming the curtilage of farmhouse and, along with H4, are fragmented from the wider hedgerow network. 'Important' hedgerowH16 is, however, proposed for retention, along with the dense continuous scrub bordering the east of the EIA site, with enough flexibility in the masterplan design to offset the development footprint from these features through retention, enhancement and creation of suitable habitat buffers.

8.4.143 Nevertheless, losses to, and fragmentation of, the hedgerow and woodland will likely affect dormouse dispersal routes, foraging habitat and breeding opportunities. Whilst new tree, shrub and hedgerow planting proposed will ensure sufficient compensation and appropriate enhancement of such resources for this species, the maturation of new planting into a usable resource will take time and will unlikely balance those negative impacts immediately arising following loss. Increased risk of collision may also arise during the construction period, resulting in direct harm to dormouse during the works. In absence of further mitigation such impacts considered negative, permanent and irreversible at the **Local** level.

8.4.144 With respect to indirect impacts, whilst dormice can become habituated to high levels of artificial light, temporary, infrequent and/or intermittent lighting may adversely affect this species. In absence of mitigation adverse effects of lighting upon dormouse is considered negative, temporary during the construction period and reversible with such effects considered to be of significance at the **Site** Level only.

Reptiles

8.4.145 Habitat losses confined predominantly to the interiors of improved grassland fields considered of limited suitability for a common reptile population. This is in addition to the permanent loss of vegetated boundary features including trees, hedgerows and associated shrub and scrub habitat, of variable value to a reptile population supported with respect to foraging, refuge and dispersal. The reduction of available habitats supporting a good slow-worm population is considered negative, permanent and irreversible and of **Site** Level significance.

8.4.146 With respect to those habitat features to be retained, degradation through damage and disturbance during the construction phase could result in the further loss of habitat important for a common reptile population. In the absence of mitigation, the effects of such impacts upon reptiles are considered to be negative, permanent and potentially irreversible. The significance of such effects upon these species is considered to be of **Site** level significance only.

8.4.147 Increased levels of traffic movements by vehicles, machinery and plant throughout the construction phase could increase the potential risk of road casualties upon this species, particularly when constructing access roads and removing vegetation across which species disperse and forage. Such impacts resulting in harm/injury to a slow-worm population are considered negative, permanent and irreversible at the **Site** level.

Operational Effects

8.4.148 Potential significant effects identified which could arise as a result of the operation of the proposed development in the absence of mitigation include the following:

- Effects of light and noise/visual/human disturbance to designated sites, habitats and species;
- Increased risk of collision and predation to species; and
- Alteration of surface water run-off/groundwater flow/site drainage.

Statutory Designations

8.4.149 The HRA undertaken by VoG considered the impact of a number of vulnerabilities on the Severn Estuary Ramsar/SAC/SPA which are pertinent during the operational phase of the proposed development including atmospheric pollution, water quality, water resources and recreational pressure. The Severn Estuary SAC/SPA/Ramsar lies directly adjacent to the eastern boundary of the EIA and, therefore, adverse impacts associated with site drainage, including surface water run-off and ground water contamination may rise. Such impacts are, however, considered unlikely subject to implementation of a sensitive drainage strategy in accordance with relevant planning policy which will be part of the inherent detailed design.

8.4.150 Nevertheless, in absence of any sensitive drainage strategy, pollution impacts upon designated sites are considered significant negative at the **Local** level which would be temporary to permanent (depending on nature/scale of pollutant) and potentially irreversible.

8.4.151 With respect to air quality and inherent within the LDP are polices aimed to reduce/limit traffic congestion through promoting sustainable transport modes, reducing the need to travel by providing local facilities within or close to the development and improving walking and cycling networks. A full assessment of the potential impacts arising from air quality is provided within Chapter 11. However, inherent within masterplan proposals are the provision and enhancement of pedestrian and cycling links throughout the EIA site, the promotion of sustainable transport and provision of a local community centre and primary school. In the absence of mitigation, air pollution impacts upon designated sites are considered significant negative at the **Local** level which would be temporary to permanent and potentially irreversible.

8.4.152 Meanwhile, an increase in residential dwellings could lead to an increase in disturbance through recreational pressure on the Severn Estuary. However, inherent with development proposals is the inclusion of areas of open public space throughout the EIA site, particularly in the north east corner, south west corner and centrally along the southern boundary of the EIA site. This is in addition to implementation of new pedestrian links and a cycleway along the alignment of the old railway lie which travels north to south through the centre of the EIA site which seek to divert recreational usage and footfall to designated routes. Combined with the availability of other open accessible green spaces within the wider landscape, impacts are considered negligible. In the absence of suitable provision of alternative open green space within the development however, impacts associated with the construction of residential

development are considered significant negative, intermittent, permanent and irreversible at a **Local** level.

8.4.153 Similar impacts may also arise with respect to those SSSIs identified above, including the Severn Estuary SSSI, Penarth Coast SSSI, Sully Island SSSI, Cog Moors SSSI and Cosmeston Lakes SSSI/LNR. Subject to implementation of the same mitigation required in respect of international designated sites, however, no significant impacts upon nationally designated sites are considered likely.

8.4.154 With respect to other statutory designates sites detailed in **Table 8.1** above, given their distance and spatial separation from the EIA site, no significant impacts are considered likely to arise. Other national designations have therefore been scoped out of this assessment accordingly.

Non-statutory Designations

8.4.155 As outlined above, adverse impacts associated with site drainage, including surface water run-off and ground water contamination, are considered unlikely, subject to implementation of a sensitive drainage strategy in accordance with relevant planning policy and is part of the inherent detailed design. However, in the unlikely absence of any sensitive drainage strategy, pollution impacts upon non-statutory designations including Cosmeston Lakes SINC and Ty'r Orsaf SINC sites are considered significant negative at the **Local** level which would be temporary to permanent (depending on nature/scale of pollutant) and potentially irreversible.

8.4.156 Similarly, an increase in residential dwellings could lead to an increase in disturbance through recreational pressure on non-statutory designations including Cosmeston Lakes SINC, Downs Wood SINC and Lavernock Point SINC and Wildlife Nature Reserve. Such impacts upon Cosmeston Lakes and Lavernock Point SINCs are, however, reduced when one considers that these SINCs are under active management to deliver both wildlife and conservation needs with extensive network of formal footpaths throughout. In the absence of suitable provision of alternative open green space within the EIA development, however, impacts associated with the construction of residential development are considered significant negative, intermittent, permanent and irreversible at a **Local** level.

8.4.157 It is considered that none of the other non-statutory designations would potentially be directly or indirectly impacted by the development proposals due to their spatial separation from the EIA site, interest features, lack of any habitat connections and/or inaccessibility to the public. These sites have been scoped out of the assessment accordingly.

Habitat IEFs

8.4.158 Increased recreational usage following occupation of the EIA site may affect sensitive woodland/hedgerow habitats through disturbances arising from trampling, increased noise, lighting, litter and insensitive management. With such effects considered to be negative, permanent, irreversible and of **Local** significance. However, inherent mitigation measures seek to reduce such effected arising, primarily through the provision of habitat buffers between boundaries of adjacent hedgerows, trees and woodland and the proposed development footprint, in addition to the siting of single-sided roadways and/or areas of formal public open space adjacent to sensitive habitats to be retained as far as possible, to

further offset the development footprint away from these habitats. Such habitat corridors will be subject to sensitive management over the long-term and excluded from curtilage boundaries adjacent to minimise future mismanagement. This is in addition to the provision of pedestrian and cycle links seeking to divert footfall away from sensitive areas.

Species IEFs

Breeding Birds

8.4.159 Retained habitats supporting breeding and foraging birds are potentially at risk of disturbance during the operational phase of the development, in the form of light spill and noise. Nesting birds' sensitive to such disturbance could abandon nests and breeding territories and become displaced from other populations. In the absence of mitigation, negative effects upon such species are considered permanent, irreversible, and of **Local** significance. However, such impacts are considered to be reduced given the retention and protection of ecologically valuable habitat including woodland, within the centre of the EIA site and peripheral hedgerows whilst new planting along site boundaries will further strengthen retained nesting habitat.

8.4.160 Increased predation of wildlife may also arise following occupation as a result of cat ownership across the development. The unmitigated impact of increased predation upon birds can be characterised as a negative effect which is probable to result, with such effects expected to be permanent and irreversible. The significance of such effects upon species is therefore considered to be of **Site** level significance.

8.4.161 Increased vehicular traffic arising following occupation could increase levels of road-kill upon species moving across the EIA site either during the day or at night time. The unmitigated impact of increased risk of collision to breeding birds can be characterised as a negative impact, with such impacts expected to be permanent and irreversible. The significance of such impacts upon species is considered to be of **Site** Level significance.

Bats

8.4.162 In relation to bats, an increase in disturbance arising from increased human presence, vehicular use noise and light originating from residential dwellings may affect the behaviour of species utilising those habitats onsite including those inhabiting the north eastern railway structure. The usage of artificial lighting across the EIA site could also result in detrimental effects upon bat species due to light spill upon adjacent habitats in use as foraging and commuting corridors. Such effects could result in the abandonment of roosting sites and displacement of dispersal routes across the proposed development, and may also result in the isolation of, and reduced interactions between, populations necessary to maintain genetic diversity. The continued ecological functionality of habitat corridors onsite may therefore be reduced. In the absence of mitigation, negative effects upon bat IEFs are considered to be negative, permanent, and irreversible. Such effects are considered to be of significance at the **Local** level.

8.4.163 Increased predation upon bats, particularly at roost sites, may also arise following occupation as a result of cat ownership across the development. The unmitigated impact of increased predation upon species can be characterised as a negative effect which is probable to result,

with such effects expected to be permanent and irreversible. The significance of such effects upon species is therefore considered to be of **Site** level significance

8.4.164 Increased vehicular traffic arising following occupation could also increase levels of road-kill upon bat species moving across the EIA site either during the night time. The unmitigated impact of increased risk of collision to species levels of disturbance upon species can be characterised as a negative impact, with such impacts expected to be permanent and irreversible. The significance of such impacts upon species is considered to be of **Site** Level significance.

Dormouse

8.4.165 As previously discussed in relation to bats, increases in visual/noise/human disturbance could result in negative effects upon dormouse, although such impacts are considerably less given the retention of ecologically valuable woodland and hedgerow habitat and provision of new planting and habitat buffers adjacent which further offset the development footprint away from dormouse habitat. In the absence of mitigation, negative effects upon dormouse are considered permanent, irreversible, and of **Local** significance to dormouse.

8.4.166 As discussed for other IEFs, there will be a potential increase in cat ownership within the area, where the unmitigated impact of increased predation upon species can be characterised as a negative effect which is probable to result, with such effects expected to be permanent and irreversible. The significance of such effects upon species is therefore considered to be of **Site** level significance

8.4.167 The use of artificial lighting across the EIA site could also result in possible detrimental effects to dormouse, although such impacts remain relatively unstudied at present with respect to this species. Increased vehicular traffic arising following occupation could also increase levels of road-kill upon dormouse moving across the EIA site either during the day or at night time. The unmitigated impact of increased lighting and risk of collision upon dormouse can be characterised as a negative impact, with such impacts expected to be permanent and irreversible. The significance of such impacts upon species is considered to be of **Site** Level significance.

Reptiles

8.4.168 Increases in visual/noise/human disturbance and lighting could result in negative effects upon reptiles, although such impacts are considerably reduced given the retention and enhancement of woodland and hedgerow habitat alongside provision of habitat buffers to comprise new shrub and/or grassland planting combined with areas of informal open green space located throughout the EIA site. In the absence of mitigation, negative effects upon reptiles are thus considered negative, permanent, irreversible, and of significance at the **Site** level.

8.4.169 Increased vehicular traffic arising following occupation could also increase levels of road-kill upon reptile individuals moving across the EIA site. The unmitigated impact of increased risk of collision to reptiles can be characterised as a negative impact, with such impacts expected to be permanent and irreversible. The significance of such impacts upon species is considered to be of significance at the **Site** level.

MITIGATION

Mitigation Measures

8.4.170 This section sets out the principles of the avoidance, mitigation or compensation measures required to reduce any potential ecological effects to insignificant levels. Overall, many potential adverse effects have been avoided or reduced through inherent mitigation incorporated into the detailed drawings and drainage strategy accompanying the application, along with the spatial separation between statutory designated sites.

8.4.171 Not all potential adverse effects can be avoided or reduced in severity through inherent mitigation alone. This section identifies any additional mitigation measures required to avoid, reduce or offset the potential for such significant negative effects. The key mechanisms described will include measures to:

- Conform with relevant and pertinent legislative requirements, particularly those associated with legally protected species; and

- Deliver and maximise opportunities for biodiversity enhancement and gain through the proposed development.

8.4.172 The key mechanisms which will be implemented are:

- **Detailed Design Measures**: The outline planning application is being made with all matters reserved with the exception of the proposed access for the EIA site. The masterplan is therefore illustrative and allows flexibility for specific detailed design measures to be secured and included within the proposed development. Such design measures can, where necessary, be agreed with the Local Authority and secured through suitably worded planning conditions and addressed at future Reserved Matters stages. The masterplan does, however, illustrate the inherent mitigation measures incorporated within the scheme, as detailed previously;

- **Ecological Construction Method Statement (ECMS) and Detailed Landscape Strategy**: Further detailed measures will be set out with respect to the management and control of the construction phase of the development to ensure protection of IEFs, in addition to details of the planting scheme and maintenance schedule for the development. The ECMS will aim to set out in detail those measures which will require implementation with respect to the protection and enhancement of all IEFs and biodiversity in general during the demolition and construction phase of the proposed development. It is proposed that the methodologies prescribed within the ECMS will be overseen by an appointed Ecological Clerk of Works (ECoW), whose scope and remit will be set out within the ECMS and any future development licenses granted by Natural Resources Wales (NRW) in respect of roosting bats and dormouse. The ECMS will also identify clearly the responsibilities of key personnel including the Site manager(s) and ECoW. The ECMS and appointment of the ECoW could be secured by way of a suitably worded planning condition; and

- **Landscape and Ecology Management Plan (LEMP) and European Protected Species Mitigation Strategies (Including Derogation Licensing)** – Detailed mitigation strategies for bats and dormouse will be prepared to inform an European Protected Species (EPS) Development Licence application should planning consent be forthcoming and will set out the recommended compensation, mitigation and enhancement measures to be implemented as part of the proposals, to ensure no significant negative effects will arise upon the favourable conservation status of EPS species following occupation. This will be further supported by a site-wide LEMP which includes the post-construction management of landscape, arboricultural, and biodiversity elements in order to ensure that a holistic approach is adopted.

8.4.173 The proposed further mitigation measures in respect of the potentially negative effects arising during the construction and occupation of the completed development are described below.

During Construction

8.4.174 All necessary ecological surveys are considered current or are being updated at the time of submission, however where relevant and depending on development timescales and phasing, certain detailed species surveys may require updating prior to commencement of the relevant phase of development. The findings will be used to inform the measures set out below.

8.4.175 Detailed measures to protect habitats and species during the construction phase will be set out within an ECMS which can be secured through an appropriately worded pre-commencement condition attached to any future planning consent and further informed by a detailed mitigation strategy with respect to bats and dormouse.

8.4.176 In general, the ECMS will include mechanisms to ensure the sensitive siting of work compound(s) and storage areas, including the storage of any fuel, chemicals, plant or machinery, sensitive clearance of the EIA site and the use of artificial lighting (including security lighting). A timetable of all key tasks to be undertaken as part of pre-construction and construction work will be provided, taking into account all species and habitat sensitivities.

Designated Sites/Habitats

8.4.177 To protect water quality of hydrologically connected statutory and non-statutory designations, appropriate pollution control measures will be employed in accordance with the relevant Pollution Prevention Guidelines (PPGs) published by the Environment Agency[15], namely PPG1 'General guide to the prevention of pollution', PPG5 'Works and maintenance in or near water', PPG6 'Pollution prevention guidance for working at construction and demolition sites', and PPG21 'Pollution incident response planning', to ensure that detrimental effects on designations an water resources as a result of surface run-off, spillage and pollution arising throughout the construction phases are avoided. Implementation of best practice will also be incorporated into the detailed design stage so as to ensure that any discharge of surface water into the natural environment is of acceptable levels and quality.

[15] PPGs were withdrawn in December 2015; however they remain the main source of information on good practice in Wales with respect to guidance on pollution prevention. A replacement guidance series, comprising Guidance for Pollution Prevention (GPPs), are currently in development.

8.4.178 The ECMS will contain measures to physically protect retained habitats onsite and adjacent through the establishment of Ecological Protection Zones (EPZs). This will include specifications for protective fencing and signage to prevent activities such as the incursion by vehicles or personnel, fires and stockpiling of materials, together with the identification of responsibilities for maintaining this fencing/signage during the demolition and construction period.

8.4.179 The ECMS will also include the restriction of construction activities to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting.

8.4.180 This will be combined with the enhancement and sensitive management of those habitats to be retained, including the majority of woodland habitat, the northern and eastern boundary hedgerows and scrub vegetation associated with the 'old quarry' adjacent to the northern boundary of the EIA site, amounting to circa 30,750m^2. This is in addition to the provision of new tree, hedgerow and shrub planting to compensate for tree loss, with new hedgerow planting proposed along the southern boundary of the EIA Site amounting to circa 13,70013,700m^2, combined with the buffering of such habitats from development.

Species IEFs

8.4.181 Protection of species during construction will be ensured through the provisions of the ECMS and relevant NRW development licences in respect of bats and dormouse where required. As a general measure aimed at protecting species, 'toolbox talks' will be provided by a suitably qualified ecologist to the principal contractor appointed by the developer, for distribution to all employees involved in any enabling works/vegetation clearance, to ensure that identification and protection of the relevant species and their habitats is understood prior to commencement.

8.4.182 Construction activities will be limited to daylight hours as far as possible to minimise disturbance to foraging and commuting habitats of value to bats, birds and the use of lighting restricted. Where this is not possible (i.e. for security purposes) lighting will directional, timed and low-lux, with internal/external shields installed as necessary to ensure minimal light spillage upon retained habitats, both within and adjacent to the development edge. Timed lighting will be programmed to ensure adequate dark periods between dusk and dawn across the EIA site, particularly adjacent to peripheral vegetation.

8.4.183 Additional sensitive methodologies will be set out within the ECMS to control traffic and movement, thereby reducing the likelihood of collision impacts occurring.

8.4.184 In addition to the habitat protection measures described above, which will deliver much of the necessary species protection, further measures to be included in the ECMS for each species group are summarised below.

Breeding Birds

8.4.185 Retained bird nesting habitats will be included within Ecological Protection Zones (EPZs). This is considered to ensure the avoidance of impacts upon the local breeding bird assemblage given their likely association with those habitats retained including woodland, scrub and trees. In particular woodland habitat within the site will be retained excepting for breaks to accommodate an access road and footpath links. This is in addition to inclusion of the following features:

- The creation of sustainable drainage features incorporating open water, vegetated swales and reed beds amounting to 26,640m^2 providing nesting and foraging habitats for a bird assemblage;

- The creation of circa 19,800m^2 of species-rich grassland habitat within areas of formal and informal open space, sensitively managed through rotational cutting to maximise species and structural diversity and to provide appropriate sward heights during the main bird breeding season; and

- The further enhancement of retained hedgerows, through infill and gap planting using native-species preferably of local provenance.

8.4.186 Given the protection afforded to all breeding birds, their nests, eggs and young, sensitive vegetation clearance (and building demolition) required during the pre-construction and construction phases of development should be timed to avoid the main bird breeding season (i.e. March to August inclusive). Should this seasonal constraint prove impracticable, then vegetation clearance/building demolition outside of this period should only commence following the advice and under supervision of a suitably qualified ecologist. Pre-commencement checks for active nests will be required prior to any vegetation clearance occurring during the main bird breeding season, with appropriate buffers marked out around active nests or nests under construction, until all eggs have hatched and chicks fledged. Such protection measures in relation to breeding birds should be included within the ECMS prepared for the EIA Site.

Bats

8.4.187 Hedgerows and retained trees with bat roost potential will be included within EPZs throughout construction. Where trees with bat roost potential are to be lost to/impacted by development, these will be subject to detailed aerial inspections, whereby all suitable roosting features will be checked at height for the presence of bats by a suitably qualified and NRW bat licensed ecologist, arboricultural contractor with a NRW bat survey licence, or with experience of working with bats and under the supervision of a NRW bat survey licence holder. With respect to the trees to be lost with bat roosting potential two detailed aerial inspections of potential roosting features should be undertaken within the main summer period (June – August/early September) and/or transitional period (late September/October - November). Should a bat roost be confirmed within any trees to be impacted by the proposals, then a development licence from NRW will be required prior to works commencing, with sufficient replacement roosting habitat provided. Where no roosts are found but bat roosting potential remains, such trees should be subject to a 'soft' felling methodology by a suitably qualified arboricultural

contractor with experience of working with bats, following the advice of the suitably qualified and licensed ecologist and supervised where necessary.

8.4.188 Nevertheless, due to the transitory nature of tree roosting bats in particular, precautionary measures are required. Specifically, an update aerial inspection of bat roosting features previously identified will be undertaken by a suitably qualified and NRW bat licensed ecologist and/or arboricultural contractor, and within no more than 48 hours of works.

8.4.189 Given the absence of bat roosts identified within buildings B1-2, B5-6 present within the EIA site during the 2016 surveys and update 2019 surveys undertaken, no constraints associated with their demolition are anticipated such that there is no requirement to obtain a development licence from NRW prior to the proposed development of the EIA site. Nevertheless, a precautionary approach to demolition of buildings B1-B2, B5-B6 is advised. Works to the roofs, soffits, bargeboards, fascias and other potential roosting features should ideally be undertaken between October to March so as to avoid the main bat roost and bird breeding seasons. Should this not be practicable, then pre-commencement checks carried out by a suitably qualified ecologist will be required immediately prior to commencement of works (see below).

8.4.190 Contractors carrying out the works should be warned of the possible presence of roosting bats and nesting birds and of their protected status. In the event of any bats (or occupied bird nests) are found during works, then all works should cease in the affected area until advice from a suitably qualified and licensed ecologist is sought.

8.4.191 Update surveys undertaken to date during 2019 did, however, identify a common pipistrelle day roost within buildings/structures B3, B4, B7 and B8, with identified roosts supporting low numbers only. As such, a development licence from NRW will be required prior to the proposed development of the EIA Site. In general, demolition works will necessarily be confined to the period 1 September to 31 March of any one year to avoid the main bat summer roosting season unless otherwise approved within the future NRW Development Licence. Prior to commencement of demolition works, suitable bat boxes will be installed on suitable mature trees present along the boundaries of retained woodland habitat to be retained following the advice of a suitably qualified ecologist. These will act as suitable receptor sites for bats in the unlikely event that any individuals are found and/or displaced during the demolition works and to compensate for roost loss arising as a result of demolition of the building. Soft-stripping of any features deemed to have potential for bats will be undertaken under the supervision of the named ecologist and/or accredited agents/assistants listed on the Development Licence. Contractors will remove all fascias, bargeboards, soffits, roof tiles, etc. by hand, carefully checking for any evidence of bats. In addition to the bat boxes installed on trees, further compensatory measures for roosting bats will be provided across the EIA site in the form of integrated bat boxes within the fabric of new or retained buildings, suitable for crevice dwelling bats.

8.4.192 The railway structure, B8 will, in contrast, be retained as part of the planning proposals for the site, albeit the former railway line will be enhanced for public access. Any lighting required for health and safety should, therefore, be implemented in accordance with a sensitive lighting strategy to avoid/minimise light spill upon this feature.

8.4.193 With respect to a foraging/commuting bat assemblage, those habitat creations measures detailed above in relation to breeding birds will provide adequate compensation for losses arising across the EIA site.

Dormouse

8.4.194 The removal of vegetation suitable for dormouse will be undertaken in accordance with the measures detailed within an approved NRW development licence. All retained vegetation will be included within Ecological Protection Zones to avoid damage during construction activities.

8.4.195 Prior to the commencement of dormouse habitat clearance works, 50 dormouse boxes (or as per the requirements of an EPS Development licence) will be installed to facilitate any future relocation of individuals during the works where necessary/appropriate, in addition to compensating for the loss of nesting resources whilst enabling future monitoring of the population thereafter. Dormouse boxes will be installed within suitable woodland, hedgerows, trees and shrubs to be retained.

8.4.196 Thereafter, both two stage (winter) and/or single stage (summer) clearance methodologies[16] will be implemented. Winter clearance methodologies will comprise clearance works to be undertaken over two stages, with first stage clearance confined to above-ground vegetation, undertaken between 1 November and 31 March inclusive (i.e. outside of the dormouse active season and main bird breeding season), and with second stage clearance in relation to all remaining vegetation below-ground, undertaken no earlier than 1 May thereafter (i.e. following dormouse full emergence from hibernation). Single stage summer clearance will also be implemented in relation to small/discrete areas of optimal dormouse habitat or larger areas of sub-optimal dormouse habitat, so as to facilitate commencement of any site enabling/pre-construction activities onsite. Single stage summer clearance works will enable the clearance of both above-ground and below-ground vegetation during the dormouse active season, albeit confined to the set periods of 1-31 May or 1 September - 31 October, and thereby avoiding the main dormouse breeding season (considered to be between mid-June and August inclusive) and hibernation period (considered to be between November and March inclusive). Suitable specimens of native, broadleaved trees and shrubs otherwise proposed for loss will also be translocated to suitable receptor sites located across the EIA site where appropriate, to close up existing gaps and speed up establishment of newly created dormouse habitat.

Reptiles

8.4.197 The ECMS will include measures to protect common reptiles during construction, focussing on sensitive displacement of individuals through phased vegetation clearance of all suitable habitats proposed for loss across the EIA site under ecological watching brief where required, with the timing of such activities ideally confined to the period late March-early October inclusive so as to avoid the reptile hibernation season.

[16] Bright, P., Morris, P. & Mitchell-Jones, T (2006). *The Dormouse Conservation Handbook, 2nd Edition*. English Nature, Peterborough.

During Operation

8.4.198 Detailed ecological management prescriptions for the long-term management of newly created and enhanced habitats in respect of protected species will be provided within a site-wide EMP which will set out in detail the following additional ecological measures to compensate for proposed habitat loss across the site and further mitigate for potential operational impacts:

- The ecological management prescriptions for defined management compartments to be retained and/or created, including: woodland, trees, grassland habitats, bat/bird/ nest box features and with respect to their establishment and long-term management;

- The monitoring of bird, and bat boxes/features (including trees with bat potential, and bat features incorporated into building design), in accordance with planning conditions and derogation licence(s) where appropriate;

- The management and maintenance of formal and informal footpaths, signage, dog/litter bins, interpretation boards and other such items; and

- The monitoring of biophysical changes to habitats including management of sedimentation, water quality and water flow of sustainable drainage and hydrological features retained and created onsite, terrestrial succession and scrub encroachment, with identified remedial measures to address any significant issues.

Designated Sites

8.4.199 In respect of statutory and non-statutory designated sites, development will be implemented in accordance with a sensitive design strategy to mitigate against negative effects arising from alterations to groundwater and surface water flow due to unforeseen pollution incidents. Subject to the above, it is considered that there will be no negative indirect effects to water quality caused by the proposed development of the EIA site. With respect to negative effects arising from air quality, further details pertaining to mitigation are provided within Chapter 11 of this ES. However, inherent within masterplan proposals is the provision and enhancement of pedestrian and cycling links throughout the EIA site, the promotion of sustainable transport and provision of a local community centre and primary school, with further bus links proposed.

8.4.200 In addition to the above, significant negative effects upon designated sites arising from increased levels of recreational usage following occupation of the proposed development will be mitigated in a number of ways, including:

- The provision of formal and informal open space throughout the EIA site creating green space links between the north east corner of the EIA to the development entrance in the south west;

- Integration of habitat and wildlife features within areas of public open space including meadow grassland, reedbeds, ponds and wetland habitats;

- Formal landscaping and tree planting across the built development footprint;

- The containment of formal footpath and cycle routes within the development footprint itself or along its edges, with informal footpath routes extending beyond the development footprint to utilise existing routes including Public Rights of Way (PRoW) and to comprise regularly mown paths through retained/created grassland/meadow habitat;

- The appropriate maintenance and long-term management of public rights of way running through the EIA site, to include the provision of litter and dog bins and gates where appropriate;

- The provision of play areas throughout the development footprint including NEAPs, LEAPS and LAPS amounting to 3930m^2; and

- The provision of a community facilities within Public Open Space (POS) features for recreation, visual amenity and cultural needs.

Habitat IEFs

8.4.201 The proposed development layout has sought to compensate for this loss through the provision of extensive new tree, hedgerow and shrub planting amounting to 13,700m^2, including the transplanting of suitable specimens of native, broadleaved trees and shrubs otherwise proposed for loss to suitable receptor sites across the EIA site where appropriate. New shrub and hedgerow planting will focus on site boundaries, creating and strengthening wildlife dispersal corridors. This will be in addition to the enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m2. Such proposals are considered to sufficiently compensate for habitat losses anticipated, whilst ensuring the protection and further enhancement of retained habitats adjacent through strengthening and broadening areas of existing woodland, treelines and hedgerows to maximise habitat function and connectivity across the EIA site and wider landscape for protected and notable species including bats, dormouse and breeding birds. It is further recommended for such planting to utilise a diversity of native species, preferably of local provenance, within any future planting mix, and to include species which bear fruit and are nectar and pollen rich.

8.4.202 This is in addition to the provision of meadow grassland (19,800m2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (26,640m2) to be sensitivity managed in the long-term to maximise the value of foraging, dispersal, breeding and hibernation resources for protected/notable species through the implementation of a sensitive hay cutting regime, so as to promote a structurally diverse and species-rich grassland sward whilst ensuring the control of scrub encroachment. Such measures will also benefit the local bat assemblage, in addition to common reptiles, nesting birds and invertebrates.

8.4.203 In addition to the above, the development footprint will be offset from retained habitats adjacent through the provision of buffers proposed either side of retained hedgerows and vegetated boundaries onsite. Such buffers will accommodate retained grassland habitat, hedgerows and trees, and extended further where necessary to accommodate larger root protection areas associated with mature tree standards and woodland edges present. Such

habitat corridors will be subject to sensitive management over the long term and excluded from curtilage boundaries adjacent to minimise future mismanagement.

8.4.204 In addition, the scheme should also ensure the implementation of a sensitive lighting strategy to ensure no/limited light spill occurs within close vicinity of boundary woodland and hedgerows. Where lighting is required along road/pedestrian routes adjacent, lighting columns should be sited within the development footprint itself and directed away from habitat edges to minimise disturbance and light spill. Lighting should include directional, timed and/or low-lux lighting, utilising shields and/or hoods where required. Such measures could be secured via planning condition attached to any future consent.

8.4.205 The proposed measures described above would ensure there is an overall enhancement of biodiversity across habitats of ecological value within the EIA site over the long-term at a Site to **Local** level.

Species IEFs

8.4.206 That habitat creation and enhancement measures described above in relation to designations and habitat IEFs will compensate for proposed habitat loss across the EIA site and, furthermore, enhance opportunities for breeding, refuge, and/or dispersal of protected species to ensure the maintenance of their favourable conservation status over the long-term.

8.4.207 In addition, the scheme will also ensure the implementation of a sensitive lighting strategy, enabling the provision of key dark corridors across the EIA site necessary to maintain dispersal, commuting and foraging routes across the EIA site to the wider landscape. Such a strategy would ensure that permanent lighting is reduced as far as possible along such key wildlife corridors to be retained, strengthened and created, including along the eastern boundary of the EIA site. Where lighting is required along road/pedestrian routes adjacent, lighting columns should be sited within the development footprint itself and directed away from habitat edges to minimise disturbance and light spill. Lighting should include directional, timed and/or low-lux lighting, utilising internal/external shields and/or hoods where required. Such measures can be secured via planning condition attached to any future consent.

8.4.208 Additional species-specific measures to minimise operational impacts and provide enhanced opportunities for species breeding and refuge should be included within the LEMP as detailed below.

Birds

8.4.209 Durable bird boxes, including a range of designs to suit different species, are recommended and should be erected on retained mature trees and buildings.

8.4.210 It is recommended that a planting scheme for the EIA site include fruit bearing species that will provide a foraging resource throughout the year.

8.4.211 This will be in addition to the sensitive management of such habitats and features in order to increase their resilience and mitigate long-term disturbance effects. Such measures will be implemented in accordance with the LEMP prepared for the EIA site.

Bats

8.4.212 New bat roosting features will be provided across the EIA site to compensate for the loss of roosts associated with buildings B3 and B7. In addition, Schwegler bat boxes should be installed upon suitable, mature trees retained along the peripheries of the EIA site and erected with a south-east/south-west facing aspect where possible and away from sources of artificial lighting so as to further mitigate for impacts upon roosts supported by B8, to be retained by the development, whilst also further enhancing the development for roosting bats. Bat box design to be installed across the EIA site should include 2F for smaller bats and 2FN for larger bats (or similar).

8.4.213 Bat roost features (such as bat tubes/bricks and/or raised ridge/roof tiles), should also be incorporated into the exterior of buildings (such as garages) where possible.

8.4.214 Additional planting of native species will be incorporated into the scheme. This will include night-scented plants such as honeysuckle, as well as a mixture of flowering plants which will flower throughout the year.

Dormouse

8.4.215 As discussed in relation to habitats, hedgerow and woodland loss is to be compensated through the retention, enhancement and further creation of existing hedgerows and woodland and wildlife corridors across the EIA site. More generally, and alongside the translocation of suitable specimens of native, broadleaved trees and shrubs otherwise proposed for loss, it is recommended for planting across the EIA site to include a range of tree and shrub species considered to provide valuable food resources during the dormouse active season, including favoured species such as oak, birch, yew, hornbeam (*Carpinus betulus*), sweet chestnut, wayfaring tree (*Viburnum lantana*), holly, guelder rose (*Viburnum opulus*), hawthorn, cherry (*Prunus avium*), hazel, apple, rowan (*Sorbus aucuparia*), ivy and honeysuckle (*Lonicera periclymenum*). Thorny and prickly shrub species should also be considered within buffers separating residential curtilages from the hedgerow network.

8.4.216 Fifty dormouse nest boxes (or as per the requirements of an EPS Development licence) will also be installed along the eastern and southern boundaries of the EIA site and along internal woodland boundaries to further compensate for the loss of nesting resources onsite whilst enabling future population monitoring.

8.4.217 To further compensate for loss of suitable dormouse habitat, native tree, shrub and hedgerow planting to be implemented across the EIA site, in addition to retained habitats, will be subject to ongoing sensitive and appropriate management over the lifetime of the development. Sensitive management will seek to maximise the value of food, dispersal, breeding, and hibernation resources for dormouse through:

- The maintenance of canopy and understorey connectivity within woodland areas through appropriate management measures, including sensitive levels of coppicing and thinning to ensure good light levels reach the woodland floor;

- The maintenance of dense and continuous hedgerow habitats through appropriate management measures, including coppicing and laying where appropriate, according

to species, to encourage the formation of a more dense and continuous hedgerow; and

- Minimising disturbance within newly planted areas through the exclusion of such habitats from adjacent curtilages.

Reptiles

8.4.218 That habitat creation, enhancement measures described above in relation to designations and habitat IEFs will compensate for proposed habitat loss across the EIA site and, furthermore, enhance opportunities for common reptiles and a resident slow-worm population.

8.4.219 This will be in addition to creation of formal hibernaculum within the north east corner of the EIA site to provide additional hibernation opportunities for reptiles and enhance the site for this group more generally.

RESIDUAL IMPACTS

Residual Effects

8.4.220 A summary of the residual effects during construction and after completion is provided in **Table 8.7** below. Subject to those mitigation measures outlined above, to be further detailed within the ECMS an LEMP and subject to sufficient habitat creation in respect of dormouse to ensure in net loss in terms of suitable habitats residual effects anticipated during the construction phase with respect to Habitat and Species IEFs have been reduced to **Negligible** levels.

IMPACTS OF CLIMATE CHANGE

8.4.221 In accordance with guidelines published by the CIEEM in September 2018, this assessment further considers potential future impacts to IEFs arising as a result of global trends and climate change which can include, but is not limited to, an increase in daily maximum/minimum temperatures, an increase in annual average rainfall and increase in mean sea level.

8.4.222 With respect to an increase in daily maximum/minimum temperatures and annual average rainfall, such effects may influence the distribution of protected species at a national level. Given that those habitats and species within the EIA site are widespread and the EIA site is not near the edge of any of their ranges, any projected change in temperatures is not anticipated to result in any significant impacts on the distribution of habitat and species IEFs.

8.4.223 With respect to rising sea levels, increased pressure upon qualify features of the Severn Estuary Ramsar/SAC/SPA/SSSI and Penarth Coast SSSI may rise following loss of habitats and coastal squeeze however. At the site level, however, the EIA site is located atop a headland with such impacts arising from proposed development is thus considered negligible.

8.4.224 Future changes in precipitation and daytime temperatures may have impacts on the hydrological regime of the EIA site with increased risk of flood events and/or drought. At the site level, however, the implementation of a sustainable drainage strategy, incorporating wetland swales, ponds and reedbeds which also provides suitable habitat for wildlife, will provide sufficient resilience to any likely effects of future climate change.

8.4.225 Inherent within the masterplan design is the inclusion of large areas of open green space throughout the EIA site, to provide benefits to wildlife as well as recreation. This includes the provision of new tree, hedgerow and shrub planting to compensate for habitat loss together with the provision of meadow grassland and sustainable drainage features incorporating open water and reed beds with such habitats providing a foraging/hibernation/breeding resource for protected species. Whilst new planting should include native species of local provenance, non-native species resilient to climate change should also be considered.

8.4.226 This is in addition to the enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats required to increase their resilience and mitigate long-term effects. Such measures have been designed to complement features inherent within the wider landscape, particularly Cosmeston Lakes which is characterised by extensive reedbeds, ponds, lakes, woodland and scrub habitat important for protected species including a breeding bird assemblage, bats, water vole, amphibians and common reptiles. The provision of suitable habitat for these species within the EIA site may provide a future stepping stone for the dispersal of these species across former agricultural land of limited ecological value and, thereby increase the resilience of local populations.

8.4.227 Furthermore, future monitoring of the new and retained habitats within the EIA site recommended to be detailed within the LEMP for the EIA site, as described above in the mitigation section, will allow an opportunity for management prescriptions to be reviewed and amended to reflect any impacts as a result of climate change. This will further safeguard the habitat and species interests at the EIA site over the long term.

CONCLUSION

8.4.228 This chapter provides an assessment of the significance and consequences of potential ecological effects upon identified IEFs arising from the proposed residential development of Land at Upper Cosmeston Farm and has been prepared as part of an ES that accompanies an Outline Planning Application for residential purposes with all matters reserved other than access.

8.4.229 Avoidance, mitigation and compensation measures have been prepared as part of a holistic ecology strategy for the proposed development to address any potential significant effects that may arise during the construction (including demolition and remediation works) and operational phases of the proposed development. Additional measures to further ensure all residual effects are avoided, mitigated and compensated for, in addition to further enhancements recommended to enable the proposed development to deliver positive ecological gain, is also discussed.

8.4.230 Further baseline information in support of this chapter is included within **Technical Appendices 8.1-8.8** and are referred to throughout the assessment. The approach taken in this assessment is made with reference to the guidelines published in 2018 by the CIEEM.

8.4.231 The baseline survey work has identified the following IEFs pertinent to the proposed development:

- Severn statuary Ramsar/SAC/SPA/SSSI;

- Penarth Coast SSSI;
- Cosmeston Lakes SSSI LNR and SINC;
- Ty'r Orsaf SINC;
- Downs Wood SINC;
- Lavernock Point SINC;
- Lavernock Point Wildlife Trust Reserve;
- Semi-natural Broadleaved Woodland;
- Hedgerow Network;
- Breeding Birds;
- Roosting Bat Assemblage;
- Foraging/Commuting Bat Assemblage;
- Dormouse; and
- Common Replies.

8.4.232 The impact assessment has identified that certain actions could result in significant negative effects. Inherent avoidance, mitigation and compensation measures, to be delivered through the detailed design of the proposals at the Reserved Matters stage and through the implementation of an ECMS, EMP and future derogation licences approved by NRW, where appropriate, are therefore proposed. Such measures will ensure that residual effects identified are sufficiently ameliorated such that no significant adverse effects upon habitat and species IEFs are likely, with beneficial effects delivered to ensure biodiversity opportunities are maximised.

8.4.233 A summary of those activities during the construction and operational phases of the proposed development impacting upon identified IEFs, including the characterisation of the unmitigated impact and its significance, the proposed mitigation, enhancement and, where necessary, compensation measures should any residual effects remain, are provided within **Table 8.7**.

8.4.234 Based on the impact assessment and consideration of the IEFs, it is concluded that the proposals will conform to the respective legislative protection afforded to these IEFs and with respect to national and local planning policy requirements.

Table 8.7: Table of Significance – Ecology and Nature Conservation

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
During Construction						
International	Severn Estuary Ramsar/SAC/SPA/ /SSSI	Surface/ground water run-off and pollution of the Severn Estuary.	Negative, temporary, reversible.	Local	The construction phase will adhere to those sensitive working methodologies and pollution prevention guidelines to be set out within the ECMS. Further protection will be afforded through implementation of a sensitive drainage strategy.	Negligible
		Increase in airborne pollutants arising from construction traffic.	Negative, temporary, reversible.	Local		Negligible
National	Cosmeston Lakes SSSI	Surface/ground water run-off and pollution of the Severn Estuary.	Negative, temporary, reversible.	Local		Negligible
		Increase in airborne pollutants arising from construction traffic.	Negative, temporary, reversible.	Local		
National	Penarth Coast SSSI	Increase in airborne pollutants arising from construction traffic.	Negative, temporary, reversible.	Local		Negligible
County	Cosmeston Lakes SINC	Surface/ground water run-off and pollution of the Severn Estuary.	Negative, temporary, reversible.	Local		Negligible
		Increase in airborne pollutants arising from construction traffic.	Negative, temporary, reversible.	Local		

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
County	Ty'r Orsaf SINC	Habitat degradation and damage during construction and landscaping works leading to physical impacts along SINC edge adjacent to development footprint.	Negative, permanent, irreversible.	Local	The construction phase will necessarily adhere to sensitive working methodologies including the implementation of protective fencing and pollution prevention guidelines to be set out within the ECMS to ensure full protection of the valued resource.	Negligible
Local	Semi-natural Broadleaved Woodland	Loss of woodland resource to facilitate access and road/footpath links.	Negative, permanent, irreversible.	Local	Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. The construction phase will adhere to sensitive working methodologies including the implementation of protective fencing and pollution prevention guidelines to be set out within the ECMS and future derogation licenses prepared in relation to dormouse and bats where required, to be approved by NRW, to ensure sensitive clearance and	
		Habitat degradation and damage during construction and landscaping works leading to physical impacts to tree roots.	Negative, permanent, irreversible.	Local		Negligible
		Disturbance impacts due to elevated noise and lighting.	Negative, temporary, reversible.	Site		Negligible
Local	Mature Hedgerow Network	Full loss of hedgerows H5-H6, H10 & H12-14, including loss of an Important hedgerow .	Negative, permanent, irreversible.	Local		Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Habitat degradation and damage during construction and landscaping works leading to physical impacts to tree roots.	Negative, permanent, irreversible.	Local	protection of retained woodland/hedgerow/tree habitats.	
		Disturbance impacts due to elevated noise and lighting.	Negative, temporary, reversible.	Site		
County	Breeding birds	Loss and erosion of hedgerow, trees and woodland resource used for foraging, breeding and shelter. Demolition of buildings associated with Lower Cosmeston Farm.	Negative, permanent, irreversible.	Site	Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2) with such habitats providing a nesting and foraging resource.	Negligible
		Habitat degradation and damage during landscaping works adjacent to hedges, trees and woodland.	Negative, permanent, irreversible	Site	Protective measures will be set out within the ECMS to ensure no adverse impacts to retained habitats will arise which could affect breeding birds.	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Disturbance impacts due to use of temporary lighting. Disturbance impacts upon breeding individuals due to erratic visual and noise disturbances during works.	Negative, temporary, reversible.	Site	The ECMS and EMP will set out requirements to restrict construction activities to daylight hours as far as possible, with use of temporary, artificial lighting avoid the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors.	Negligible
		Direct harm/njury.	Negligible (subject to legal compliance)	Site	Sensitive clearance measures will be set out within the ECMS to ensure no harm to breeding birds.	Negligible
		Increased risk of collision from traffic due to increased vehicle, machinery and plant movement across the site and adjacent to sensitive habitats.	Negative, temporary, irreversible	Site	The ECMS and EMP will set out requirements to restrict construction activities to daylight hours as far as possible. Additional sensitive methodologies set out within the ECMS to control traffic and movement will further reduce the likelihood of such impacts occurring.	Negligible
Local	Bats	Loss of a three common pipistrelle and summer day roosts associated with buildings B3, B4 and B7. Potential	Negative, permanent, irreversible.	Local	Adhere to sensitive working methodologies set out within the ECMS and future derogation licence prepared in relation to bats, to ensure full protection of the valued resource. Provision of new, compensatory roosting features.	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		killing/injury during demolition.				
		Loss of trees T5, T7-T11, and T13-T19 with high potential to support roosting bats T12 with moderate potential and G1 and T35-T36 with low. Risk of killing and injury during tree works should a bat roost be present.	Negative, permanent, irreversible.	Local	Re-inspection of trees with bat potential together with sensitive clearance measures (which may require implementation under a derogation licence to be approved by NRW), as detailed within the ECMS will be followed to ensure no harm to roosting bats.	Negligible
		Loss of hedgerow/woodland resource totalling circa 7,603m^2 used for commuting and foraging. Additional loss of poor semi-improved/improved grassland habitat likely used for limited foraging.	Negative, permanent, irreversible.	Local	Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2) with such habitats providing a foraging resource.	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Habitat degradation and damage during construction and landscaping works adjacent to retained structures and trees with bat roost potential. Risk of killing and injury during works.	Negative, permanent, irreversible.	Local	Protective measures to be set out within the ECMS and EMP will ensure no adverse impacts to retained habitats will arise which could affect bats.	Negligible
		Disturbance impacts due to use of temporary lighting.	Negative, intermittent, temporary, reversible.	Site	The ECMS will set out requirements to restrict construction activities to daylight hours as far as possible, with use of temporary, artificial lighting avoid the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors.	Negligible
Local	Dormouse	Risk of killing and injury during clearance, with loss and erosion of tree, hedgerow and associated shrub and scrub habitat totalling circa 7,603m^2 used for breeding, foraging and dispersal.	Negative, permanent, irreversible.	Local	Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. In respect to dormouse, there should be no net loss in terms of suitable habitat for this	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Habitat degradation and damage during construction and landscaping works adjacent to hedgerow and woodland network. Risk of killing and injury during works.	Negative, permanent, irreversible.	Local	species, with the masterplan providing sufficient flexibility to accommodate additional shrub planting. 50 dormouse boxes to be installed within suitable dormouse habitats to be retained prior to commencement to facilitate any future relocation of individuals during clearance works where necessary/appropriate, in accordance with licence requirements. Sensitive clearance measures (which will require implementation under derogation licence to be approved by NRW), will be followed to ensure no harm to dormouse. Protective measures to be set out within the ECMS and EMP will ensure no adverse impacts to retained habitats will arise which could affect dormouse.	
		Disturbance impacts during construction due to use of temporary lighting.	Negative, temporary, reversible.	Site	The ECMS will set out requirements to restrict construction activities to daylight hours as far as possible, with use of temporary, artificial lighting avoid the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors.	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Increased risk of collision from traffic due to increased vehicle, machinery and plant movement across the site and adjacent to sensitive habitats.	Negative, permanent, irreversible.	Site	The ECMS and EMP will set out requirements to restrict construction activities to daylight hours as far as possible. Additional sensitive methodologies and protective measures set out within the ECMS to control traffic and movement will further reduce the likelihood of such impacts occurring.	Negligible
Local	Reptiles	Loss of habitat for foraging, basking, hibernation and dispersal including poor semi-improved/improved grassland and woody habitats. Risk of killing/injury during works.	Negative, permanent, irreversible.	Site	Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2) with such habitats providing a foraging resource. Sensitive clearance measures will be set out within the ECMS to ensure no harm to common reptiles.	Negligible
		Habitat degradation and damage during construction and landscaping works adjacent to hedgerow network. Risk of killing and injury during works.	Negative, permanent, irreversible	Site		Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Increased risk of collision from traffic due to increased vehicle, machinery and plant movement across the site and adjacent to sensitive habitats.	Negative, temporary, irreversible.	Site	The ECMS and EMP will set out requirements to restrict construction activities to daylight hours as far as possible. Additional sensitive methodologies and protective measures set out within the ECMS to control traffic and movement will further reduce the likelihood of such impacts occurring.	Negligible
During Operation						
International	Severn Estuary Ramsar/SAC/SPA/ /SSSI	Increased recreational use affecting sensitive habitats through trampling, increased noise and litter.	Negative, temporary/permanent, irreversible.	Local	Provision and sensitive design of areas of informal and formal open space alongside a network of footpaths and cycleways across the site inherent within the design will seek to divert recreational use away from designation and deliver recreational, visual amenity, cultural and wildlife benefits. Existing rights of way will be strengthened through appropriate/ renewed signage, dog bins, styles and gates where necessary. Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
					habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2).	
		Alterations to groundwater and surface water flow due to unforeseen pollution incidents.	Negative, temporary, reversible.	Local	Protection through sensitive drainage strategy in accordance with local and national policy.	Negligible
		Increase in airborne pollutants arising from additional traffic generated by residential development.	Negative, temporary, reversible.	Local	Further details are provided within Chapter 11. However, there will be provision and enhancement of pedestrian and cycling links throughout the EIA site, the promotion of sustainable transport and provision of a local community centre and primary school to reduce the need to travel.	Negligible
National	Penarth Coast SSSI Cog Moors SSSI Sully Island SSSI	Increased recreational use affecting sensitive habitats through trampling, increased noise and litter.	Negative, temporary/permanent, irreversible.	Local	Provision and sensitive design of areas of informal and formal open space alongside a network of footpaths and cycleways across the site inherent within the design will seek to divert recreational use away from	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
					designation and deliver recreational, visual amenity, cultural and wildlife benefits. Existing rights of way will be strengthened through appropriate/ renewed signage, dog bins, styles and gates where necessary. Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2).	
		Increase in airborne pollutants arising from additional traffic generated by residential development.	Negative, temporary, reversible.	Local	Further details are provided within Chapter 11. However, there will be provision and enhancement of pedestrian and cycling links throughout the EIA site, the promotion of sustainable transport and provision of a local community centre and primary school to reduce the need to travel.	Negligible
National	Cosmeston Lakes SSSI, LNR and SINC	Increased recreational use affecting sensitive habitats through	Negative, temporary/permanent, irreversible.	Local	Provision and sensitive design of areas of informal and formal open space alongside a network of footpaths and cycleways across	

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		trampling, increased noise and litter.			the site inherent within the design will seek to divert recreational use away from designation and deliver recreational, visual amenity, cultural and wildlife benefits. Existing rights of way will be strengthened through appropriate/ renewed signage, dog bins, styles and gates where necessary. Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2).	
		Alterations to groundwater and surface water flow due to unforeseen pollution incidents.	Negative, temporary, reversible.	Local	Protection through sensitive drainage strategy in accordance with local and national policy.	

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Increase in airborne pollutants arising from additional traffic generated by residential development.	Negative, temporary, reversible.	Local	Further details are provided within Chapter 11. However, there will be provision and enhancement of pedestrian and cycling links throughout the EIA site, the promotion of sustainable transport and provision of a local community centre and primary school to reduce the need to travel.	
County	Ty'r Orsaf, Downs Wood and Lavernock Point SINCS and Lavernock Point Wildlife Trust Reserve	Increased recreational use affecting sensitive habitats through trampling, increased noise and litter.	Negative, permanent, irreversible.	Local	Provision and sensitive design of areas of informal and formal open space alongside a network of footpaths and cycleways across the site inherent within the design will seek to divert recreational use away from designation and deliver recreational, visual amenity, cultural and wildlife benefits. Existing rights of way will be strengthened through appropriate/ renewed signage, dog bins, styles and gates where necessary. Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and	Negligible

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
					recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2).	
Local	Semi-natural Broadleaved Woodland	Increased recreational pressure affecting woodland through vandalism, damage and insensitive management.	Negative, permanent, irreversible.	Local	Provision of new tree, hedgerow and shrub planting amounting to circa 13,700m^2 to compensate for habitat loss, together with habitat buffering, enhancement and sensitive long-term management of retained woodland, hedgerow and scrub habitats amounting to circa 30,750m^2. This is in addition to the provision of meadow grassland (circa 19,800m^2) for wildlife and recreation and sustainable drainage features incorporating open water and reed beds (circa 26,640m^2). Newly created and enhanced habitats will be subject to sensitive management over the long-term to maintain the integrity of the hedgerow/woodland resource onsite. The development footprint will further be offset from retained hedgerows/woodland through provision of habitat buffers measuring minimum 5m in width either side, and greater where necessary to accommodate root protection areas.	Negligible, possible minor beneficial with appropriate landscaping

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Disturbance from lighting and noise.	Negative, permanent, irreversible	Local.		
Local	Hedgerow Network	Increased recreational pressure affecting hedgerows through vandalism and damage.	Negative, permanent, irreversible	Local		Negligible, possible minor beneficial with appropriate landscaping
		Disturbance from lighting and noise.	Negative, irreversible, permanent.	Local.		
Local	Breeding Birds	Visual and noise disturbance arising from increased recreational use of habitats.	Negative, permanent, irreversible.	Local	Provision and long-term management of new tree, hedgerow and shrub planting in addition to wetland/reed bed habitats, together with habitat buffering, to create strong foraging, dispersal, commuting and dark flight corridors whilst offsetting potential disturbances arising upon key breeding bird, bat, dormouse and reptile habitat. In respect to dormouse, there should be no net loss in terms of suitable habitat for this species, with the masterplan providing sufficient flexibility to accommodate additional shrub planting. It is further advised that planting incorporate suitable fruiting species which are pollen and	Negligible pending sufficient

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
					nectar rich and therefore beneficial to breeding birds, birds and dormouse. Provision of dormouse boxes across suitable habitat will be required for monitoring purposes as a condition of a development licence from NRW. Inclusion of a range of bird and bat boxes and roost features to be installed upon suitable mature trees to be retained and integrated into building design to increase opportunities for these groups. More generally, the commitment to sensitive habitat management and monitoring over the long term and requirement for a sensitive lighting strategy, as detailed within the ECMS and EMP and in accordance with the requirements of the derogation licence from NRW, will further ensure that such resources are sensitively and appropriately managed for protected species.	
		Increased levels of illumination by street lighting and light spill from residential development.	Negative, permanent, irreversible.	Local		

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Increased risk of collision from traffic.	Negative, permanent, irreversible.	Site		
		Increased levels of predation due to pet ownership.	Negative, permanent, irreversible.	Site		
Local	Bats	Visual and noise disturbance arising from increased recreational use of habitats.	Negative, permanent, irreversible	Local		
		Increased levels of illumination by street lighting and light spill from residential development.	Negative, permanent, irreversible.	Local		
		Increased risk of collision from traffic.	Negative, permanent, irreversible.	Site		
Local	Dormouse	Visual and noise disturbance arising from increased recreational use of habitats.	Negative, permanent, irreversible.	Local		
		Increased levels of illumination by street lighting and light spill from residential development.	Negative, permanent, irreversible.	Site		

Level of Importance	Important Ecological Feature	Description of Potential Impact and Effects Arising	Characterisation of Impact	Ecological Significance of Impact if Unmitigated	Mitigation and Compensation Proposals	Residual Effects following Mitigation
		Increased levels of predation due to pet ownership.	Negative, permanent, irreversible.	Site		
Local	Reptiles	Visual and noise disturbance arising from increased recreational use of habitats.	Negative, permanent, irreversible.	Site		Negligible
		Increased levels of illumination by street lighting and light spill from residential development.	Negative, permanent, irreversible	Site		
		Increased risk of collision from traffic.	Negative, permanent, irreversible	Site		

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