APPENDIX 5.1 ECOLOGICAL IMPACT ASSESSMENT METHODOLOGY

5.1 INTRODUCTION

5.1.1 The ecological impact assessment (EcIA) contained in this Chapter has been undertaken with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) guidance[1] and the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended). It focuses on those activities that could potentially generate significant environmental effects on ecological receptors.

5.1.2 Ecological Impact Assessment (EcIA) is defined within the CIEEM guidelines as **'a process of identifying, quantifying and evaluating the potential effects of development related or other proposed actions on habitats, species and ecosystems'**. The CIEEM guidelines stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological receptors that are sufficiently widespread, unthreatened and resilient to impacts of the proposed development. As such, the assessment considers effects upon designated sites and ecological receptors which are considered important on the basis of relevant guidance and professional judgement.

5.1.3 Where ecological receptors are not considered sufficiently important as to warrant a detailed assessment, or where they would not be significantly affected on the basis of baseline information, these are 'scoped out' of the assessment. Mitigation measures for such receptors may however, still be outlined as appropriate to reduce and/or avoid any potentially adverse effects or to ensure legislative compliance

5.1.4 The assessment includes the following stages:

- determination and evaluation of important/sensitive ecological receptors;
- identification and characterisation of impacts;
- outline of mitigating measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures; and,
- identification of appropriate compensation measures to offset significant residual effects.

5.1.5 For the purpose of the assessment, the terms 'impacts' and 'effects' are referred to in accordance with the definitions set out in the CIEEM Guidelines as follows:

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

5.2 ZONES OF INFLUENCE

5.2.1 The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposal and associated activities. The zones of influence that extend beyond the direct land-take required for

[1] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester

the proposed development have been identified based upon the nature of the completed project and the construction activities to be undertaken, informed by the consultation and Scoping process and current CIEEM and Natural England guidance where available. The zone of influence will therefore vary for different ecological features depending on their sensitivity to an environmental change. The zones of influence were used to establish the scope of baseline ecological surveys and the extent of survey area and desk study.

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

5.3 SIGNIFICANT EFFECTS

5.3.1 Ecological Impact Assessment (EcIA) is defined within the CIEEM guidelines as **'a process of identifying, quantifying and evaluating the potential effects of development related or other proposed actions on habitats, species and ecosystems'**

5.3.2 The EIA Regulations[2] require the description of the **'likely significant environmental effects of the proposed development on the environment'** (Regulation 18(3)(b)).

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

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

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

5.3.6 CIEEM guidelines on ecological impact assessment note that:

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

5.3.7 For ease of reference **Table A5.1** below sets out adapted CIEEM terminology which also shows the equivalent EIA terms as used in Chapter 5: Biodiversity.

Table A5.1: EIA regulations and CIEEM Terminolgy.

Effect	Significance	CIEEM Definition
Substantial or Moderate	Significant	Positive effect on ecological

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

beneficial		integrity or conservation status at a County, National or International geographic scale
Minor Beneficial	Not significant	Positive effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only
Negligible or Neutral	Not significant or neutral	No discernible or significant on ecological integrity or conservation status (e.g. species or habitat).
Minor Adverse	Not significant	Adverse effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only.
Moderate or Substantial Adverse	Significant	Adverse effect on ecological integrity or conservation status at a County, National or International geographic scale.

5.4 ASSESSMENT

5.4.1 The Proposed Development has been assessed as having a lifetime of 40 years for the purpose of this assessment and ecological effects have been described in terms of their duration as short, medium term and long-term as follows:

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

5.4.2 The ecological impact assessment includes:

- An evaluation of identified important ecological features and potential receptors; faunal species, habitats and vegetation (as appropriate) on an international, national and regional basis;
- A description and evaluation of the potential effects of the Proposed Development on statutory and non-statutory sites designated for nature conservation;
- A description and evaluation of the potential effects of the Proposed Development on species and habitats;
- Mitigation measures implemented to address any identified significant adverse effects;
- An assessment of cumulative effects;
- Identification of any residual effects after mitigation; and
- Identification of opportunities for biodiversity enhancement.

5.4.3 For the purposes of this assessment the importance or sensitivity of an ecological feature is considered within the context of a defined geographical area, ranging from International (high value) to Site (low/negligible), as detailed in **Table A5.2**.

Table A5.2: Value/ Sensitivity Assessment

Value or Sensitivity of Receptor /	**Definition examples**

Geographic Scale of Importance	
High - International / European	Greater than a UK scale, typically valued at a European level such as internationally designated sites (Special Protection Areas (SPA), Special Areas of Conservation (SAC) and/ or Ramsar sites) or proposed/ candidate site (pSPA or cSAC), large area of a habitat listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of the larger whole, large population of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) or species listed in Annex IV of the Habitats Directive.
High - National (UK)	UK: A nationally designated site (e.g. Site of Special Scientific Interest) or a discrete area which meets the selection criteria for national designation. An area of a priority habitat listed under Section 41 (England) of the Natural Environment and Rural Communities Act 2006 which constitutes a significant proportion of the UK resource of that habitat. A regularly occurring, regionally significant population of any nationally important species listed as a UK BAP / Biodiversity List and priority species listed under Section 41 (England) of the Natural Environment and Rural Communities Act 2006, and Species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.
Medium Regional / County	Locally designated sites (Local Nature Reserves, County or Local Wildlife Sites). Areas of priority habitat which constitutes a significant proportion of the County's resource of that habitat. A regularly occurring, locally significant population of any nationally important species listed as a UK BAP / priority species and priority species listed under Section 41 (England) of the Natural Environment and Rural Communities Act 2006, and Species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.
Low - Local	Local area around the Proposed Development. For example areas of priority habitat which are not large enough to meet the criteria for County value, or small but sustainable

	populations of a protected or notable species
Low/Negligible - Site	Considered within the context of the Site only.

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

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

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

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

5.4.8 Ecological effects are described as far as possible and where available information allows in terms of the parameters detailed in **Table A5.3**

5.4.9 Magnitude of effect, based on the effects that the Proposed Development would have upon the resource/receptor, is considered within the range of high, medium, low, negligible. Consideration is given to scale, duration of impact/effect, and extent of Proposed Development with reference to the definitions in **Table A5.3**. The assessment considers how existing baseline conditions may change over time, as for example the baseline conditions could alter through operational land use, in the form of differing management and natural growth or succession of habitats.

Table A5.3 Environmental Parameters

Environmental Parameter	Description
Magnitude	The 'size' or amount of an effect is referred to as the magnitude and is determined on a quantitative basis where possible supported by professional judgement.
Extent	The area over which an effect occurs. The magnitude and extent of an effect may be synonymous
Duration	The time over which an effect is expected to last prior to the recovery or

	replacement of the ecological receptor. This can be considered in terms of life cycles of species or regeneration of habitats. The duration may be longer than the duration of an activity
Reversibility	Reversible (or temporary) effects are those that occur during the lifetime of the development and where spontaneous recovery or mitigation allows recovery within a reasonable timescale. Permanent effects are those which cannot be recreated within the proposed development or there is no reasonable chance that actions can be undertaken to reverse it.
Timing and Frequency	The timing of effects in relation to important seasonal and/or life cycle constraints. The frequency with which activities and simultaneous effects would take place can be an important determinant.

5.4.10 The assessment of effects is based upon the assessments of magnitude of effects and sensitivity of the resource/receptor to come to a professional judgement of how important this effect is. The magnitude of change effected on ecological receptors is described as set out in **Table A5.4**. The likelihood or probability that an effect will occur is addressed as far as possible based on available information. Whilst it is reasonably straightforward to identify effects that are certain to occur, or conversely will not occur, it is generally more difficult to assign a quantified level to occurrences defined as likely, unlikely or highly unlikely. In these circumstances, professional judgement has been used, with reasoning supported by available evidence

Table A5.4: Magnitude of Impact/Change

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

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

5.4.12 It is recognized that discernible effects can also occur at a local geographic scale which are not sufficiently severe to be assessed as 'significant' in accordance with the EIA approach, and do not require specific mitigation, but nonetheless merit discussion. In the interest of completeness these effects are discussed in Chapter 5: Biodiversity in relation to general construction good practices to be adopted to avoid or minimise low-level or minor disruption to local features, including for example standard pollution prevention and control measures.