Appendix 10B: Ecological Impact Assessment Methodology

APPENDIX 10B – ECOLOGICAL IMPACT ASSESSMENT METHODOLOGY

10B.1 Overview of the Approach Taken

10B.1.1 Ecological Impact Assessment (EcIA) is the process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on relevant habitats, species and ecosystems (relevant ecological features). The assessment approach applied is based upon recognised good practice Guidelines for Ecological Impact Assessment in the UK and Ireland published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2016). The aims of this EcIA are to:

- identify relevant ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted;.
- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out what steps would be taken to adhere to legal requirements relating to the relevant ecological features concerned.

10B.1.2 The principal steps involved in the CIEEM approach can be summarised as:

- ecological features that are both present and might be affected by the Proposed Development are identified (both those likely to be present at the time works begin, and for the sake of comparison, those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;
- the importance of the identified ecological features is evaluated to place their relative biodiversity and nature conservation value into geographic context, and this is used to define the relevant ecological features1 that need to be considered further within the EcIA process;
- the changes or perturbations predicted to result as a consequence of the Proposed Development (i.e. the potential impacts), and which could potentially affect relevant ecological features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;
- the likely effects (beneficial or adverse) on relevant ecological features are then assessed, and where possible quantified;

[1] The term 'important ecological features' used in the 2nd Edition of the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2016) is equivalent to the term 'relevant ecological features' used throughout this EcIA and can refer to habitats, species and/or ecosystems and their functions or services.

- measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on features of nature conservation importance are also included;
- any residual effects of the proposed development are reported; and
scope for ecological enhancement is considered.

10B.1.3 In line with the CIEEM guidelines the terminology used within the EcIA draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of the EcIA these terms are defined as follows:

- impact – actions resulting in changes to an ecological feature. For example, demolition activities leading to the removal of a building utilised as a bat roost; and
- effect – outcome resulting from an impact acting upon the conservation status or structure and function of an ecological feature. For example, killing/injury of bats and reducing the availability of breeding habitat as a result of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

10B.2 Approach Taken When Valuing Ecological Features

10B.2.1 The data obtained through consultation, desk studies and field surveys has identified a variety of ecological features, not all of which require further consideration within the EcIA. One of the key challenges in EcIA is to decide which ecological features are important and should be subject to detailed assessment. CIEEM guidance states that it is only necessary to "*undertake a systematic assessment of relevant ecological features that could be significantly affected (including adverse and beneficial effects)".* This is consistent with EIA Regulations, which only require investigation of likely significant effects. Such an approach also has the benefit of helping to keep EcIA focussed and manageable.

10B.2.2 It is not necessary to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*", although this does not mean that efforts should not be made to safeguard wider biodiversity and national policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity (CIEEM, 2016).

10B.2.3 To support focussed EcIA there is a need to determine the scale at which the specific ecological features identified through the desk studies and field surveys undertaken for the Proposed Development are of value. The approach taken when valuing ecological features needs to be robust as it provides much of the rationale for the identification and further assessment of relevant ecological features.

10B.2.4 Ecological features can be of value for a variety of reasons and the rationale used should be explained to demonstrate a robust selection process. Value may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline. There are a number of factors to consider when determining the relative value of an ecological feature.

10B.2.5 Importance may be defined by the quality or extent of designated sites or habitats, their rarity in a geographical context, and their rate of decline either locally or nationally. CIEEM (2016)

identifies a number of characteristics that can be used to identify ecological features likely to be important in terms of their biodiversity value as follows:

- animals or plant species, subspecies or varieties that are rare or uncommon, internationally, nationally or more locally;
- ecosystems and their component parts that provide the habitats required by the above species, population and/ or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitat diversity, connectivity and/ or synergistic associations;
- notably large populations of animals or concentrations of animals considered uncommon or threatened in a wider context;
- plant communities (and their associated animals) that are considered to be typical of valued natural/ semi-natural vegetation types;
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change;
- species-rich assemblages of plants or animals; and
- typical faunal assemblages that are characteristic of homogenous habitats.

10B.2.6 Where available, relevant guidance is used to inform valuation of ecological features. Resources relevant to the Study Area include local guidance for the identification of ecological features of value in North Yorkshire (North Yorkshire SINC Panel, 2008), the Selby Biodiversity Action Plan, and National Character Area Profile 39: Humberhead Levels. The status of habitats and species that are rare or threatened is outlined nationally in various Red Data Books and Lists, and also in the NERC Act s41 list of habitats and species of principal importance for nature conservation in England. There are national criteria for rarity and level of threat to populations for different groups of species, and guidance on the assessment of relative value such as the Ratcliffe Criteria (Ratcliffe, 1977). Species may be widespread or common nationally, but of scarce occurrence in the county or district. Conversely, a species may be common in a county or district context, but considered rare nationally. In addition, some species termed legally protected species, such as bats, badger and reptiles, are given statutory protection that protects them from harm or forms of disturbance but that does not necessarily translate to biodiversity value e.g. a transitory occurrence of a single individual of a protected bat species would not be afforded the same weight as a regularly occurring large population of bats.

10B.2.7 Expert judgement has also been used as appropriate when assigning value, particularly where species or habitats are poorly known or guidance is lacking. Ecological features may be identified that are not included in lists of notable habitats and species, but that can be considered important on the basis of expert judgment e.g. because of their local rarity or because they enable effective conservation of other important features (CIEEM, 2016).

10B.2.8 The value of ecological feature has been defined with reference to the geographical level at which it matters. The frames of reference used for this assessment, and based on CIEEM guidance, are:

- international (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- national (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- regional (Yorkshire);

- county (North Yorkshire);
- district (Selby);
- local (has value at the Site level); and
- negligible (has a very low value at the Site level but is not considered to merit retention or mitigation).

10B.3 Characterising Potential Ecological Impacts

10B.3.1 When describing potential impacts (and where relevant the resultant effects) reference is made to the following characteristics:

- beneficial/ adverse - i.e. is the change likely to be in accordance with nature conservation objectives and policy:
    - beneficial (i.e. positive) - a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value;
    - adverse (i.e. negative) - a change that reduces the quality of the environment. e.g. destruction of habitat or increased noise disturbance.
- magnitude - the 'size', 'amount' or 'intensity' of an impact - this is described on a quantitative basis where possible;
- spatial extent - the spatial or geographical area or distance over which the impact/effect occurs;
- duration - the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. The likely duration of the impact should be quantified (e.g. 2 weeks duration; 5 to 10 years). Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
- reversibility - i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and an enforceable. A permanent effect is one from which recovery is either not possible, or cannot be achieved within a reasonable timescale (in the context of the feature being assessed); and
- timing and frequency - i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons.

10B.3.2 For each receptor only those characteristics relevant to understanding the ecological effect and determining the significance are described.

10B.4 Method for Determining the Significance of Effects

10B.4.1 The assessment approach follows the good practice guidelines for EcIA described in CIEEM (2016). For each ecological feature only those characteristics relevant to understanding the ecological consequences (effect) of the impact and its relative significance are described, based on the project description and the assumption that standard industry best practice would be applied (e.g. implementation of standard dust suppression and pollution prevention measures).

10B.4.2 Potential impacts on relevant ecological features are assessed and a judgement reached on whether or not the resultant effect on conservation status or structure and function is likely to be significant. This process takes into consideration the characteristics of the impact, the sensitivity of the ecological feature concerned, and the geographic scale at which the feature is considered important.

10B.4.3 CIEEM (2016) states that: "*For the purposes of EcIA a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'* (i.e. relevant ecological features) *or for biodiversity in general … In broad terms, significant effects encompass impacts on the structure and function of defined application sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution).*"

10B.4.4 For nature conservation designations, other defined habitats and ecosystems the assessment considers what effect the potential impacts are likely to have on conservation objectives or interest/ qualifying features. For ecosystems, consideration is given to whether a change in ecosystem structure and/ or function is likely that would substantively alter its ecological integrity.

10B.4.5 For habitats and species, the assessment considers what effect the potential impacts will have on "conservation status", and whether or not the effect is likely to substantively alter the ecological integrity of the habitat or species under consideration. Further guidance on how to assess conservation status is provided in CIEEM (2016) as follows:

- for habitats: "*conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area*"; and
- for species: "*conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area*."

10B.4.6 In considering effects on conservation status, reference is made to relevant available guidance on the current conservation status of the ecological feature under consideration. Effects will either be:

- not significant (i.e. no ecologically meaningful effect on conservation status); or
- significant (i.e. an ecologically meaningful effect on conservation status).

10B.4.7 Such judgements will be based, wherever possible, on quantitative evidence. However, where necessary the professional judgement of an experienced ecologist has been applied.

10B.4.8 For those effects considered significant, the effect will also be characterised as appropriate (e.g. adverse or beneficial), and qualified with reference to the geographic scale at which the effect is significant (e.g. an adverse effect significant at a national level).

10B.4.9 The scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, a local effect on a species of principal importance for nature conservation at the national level (as listed on NERC Act s41) may not have a significant effect on the national population of that species.

10B.5 Application of the Mitigation Hierarchy

10B.5.1 The identification and specification of mitigation proposals in this assessment has been undertaken with regard to the principles of the mitigation hierarchy i.e.:

1. avoid ecological features where possible;
2. reduce (minimise) the magnitude of the potential impact e.g. through iterative design and/ or advance commitment to sensitive methods or timing of working (sometimes termed as embedded mitigation or mitigation by design);
3. mitigate the potential effect through the application of additional proven measures, such that the residual effect realised is reduced in magnitude (non-embedded mitigation); and
4. compensate for significant residual effects, e.g. by providing suitable habitats elsewhere. Proposals should achieve appropriate compensation in a reasonable timeframe and be legally enforceable.

10B.5.2 This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted should lower levels be considered. Where it is reasonably practicable to do so then attempts have been made to avoid potential impacts. Where impacts cannot be avoided then efforts have been made to limit the magnitude of the potential impact and to mitigate the resultant effects through the provision of appropriate measures. Where effects cannot be mitigated to a level where they are not significant then compensatory measures have been employed to (as far as is reasonably possible) offset any remaining adverse effects.

10B.6 Comparing CIEEM Assessment Outputs with Significance Categories used in other Assessments

10B.6.1 In order to provide consistency of terminology in the conclusions of the assessment the residual effects of the Proposed Development are translated to a significance level on a scale of neutral, minor, moderate and major comparable to that used in other Environmental Statement chapters as outlined in Table 10B.1. These conclusions are provided in each case in brackets following the equivalent CIEEM assessment conclusion.

Table 10B.1 Relating CIEEM assessment terms to those used in other Environmental Statement chapters

Effect significance terminology used in other Environmental Statement chapters		Equivalent CIEEM assessment
Significant (beneficial)	Major beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
	Moderate beneficial	Beneficial effect on structure/function or conservation status at county level.
Non-significant	Minor beneficial	Beneficial effect on structure/function or conservation status at Site or local level.
Non-significant	Neutral	No effect on structure/function or conservation status.
Non-significant	Minor adverse	Adverse effect on structure/function or conservation status at Site - local level

Significant (adverse)	Moderate adverse	Adverse effect on structure/function or conservation status at county level.
	Major adverse	Adverse effect on structure/function or conservation status at regional, national or international level.