12. ECOLOGY

Introduction

12.1 The Ecological Chapter of the ES has been prepared by Envirotech NW Ltd. This chapter builds upon and updates work undertaken by Simply Ecology in 2012[i], 2017[ii] and 2019[iii].

Ecological Impact Assessment

12.2 The purpose of an Ecological Impact Assessment (EcIA) is to:

- Provide an objective and transparent assessment of the ecological effects of a project;
- Facilitate objective and transparent determination of the consequences of the project in terms of national, regional and local policies relevant to nature conservation and biodiversity; and
- Set out what steps will be taken to adhere to legal requirements relating to designated sites and legally protected or controlled species.

12.3 This chapter of the ES assesses the likely impacts of the Development on ecological features of value. This includes the likely impacts on designated wildlife sites, habitats of nature conservation interest and legally protected and notable species of plants and animals.

12.4 The chapter describes the assessment methodology; establishes the baseline conditions currently existing at the Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

12.5 The chapter has been prepared with reference to the Chartered Institute of Ecology and Environmental Management's (CIEEM) Ecological Impact Assessment Guidelines (CIEEM, 2016)[iv]. Detailed methods and data from baseline surveys are provided in the Technical Appendices.

12.6 The scope of this assessment has been determined through consideration of the potential direct and indirect impacts associated with the Development on the ecological receptors which may be affected.

Planning Policy and Legislation

12.7 The following relevant policies and legislation were taken into account during the ecological assessment.

National Planning Policy and Planning Guidance (NPPF)v

12.8 The NPPF, published in March 2021 advocates a presumption by Local Planning Authorities (LPAs) in favour of sustainable development that enhances the natural environment by avoiding, adequately mitigating or compensating for significant harm to biodiversity, and which delivers net gains for biodiversity.

12.9 Guidance on nature conservation planning policy is provided in Section 15 of the NPPF *'Conserving and enhancing the natural environment'*.

NPPF Core Planning Principles

12.10 Paragraph 8 of the NPPF states that

> *'Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives).'*

12.11 Of the 3 principles outlined, the following are relevant to ecology and nature conservation:

> *"An environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."*

Conserving and Enhancing the Natural Environment

12.12 NPPF Section 15, paragraph 149 states

> *"To protect and enhance biodiversity and geodiversity, plans should:*
>
> *a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity61; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*

> *b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity."*

Local Planning Policy and Planning Guidance

Lancashire Green Infrastructure Strategy[vi]

12.13 The purpose of the Lancashire Green Infrastructure Strategy is to underpin and enhance the delivery of other strategic plans and programmes. Whilst the strategy does not form statutory policy in itself, it does influence the delivery of planning policy.

12.14 The strategy has seven key strategic objectives (relevant ecological points emboldened):

- to improve quality of place
- to improve health and well-being
- to create the setting for investment
- to enhance the tourism, recreation and leisure
- to enhance biodiversity and ecosystem services
- to adapt to and mitigate the effects of climate change
- to grow and develop the Regional Parks in Lancashire.

Central Lancashire Core Strategy DPD 2012[vii]

12.15 At a local level the adopted Central Lancashire Core Strategy sets out the vision, objectives and spatial strategy for Central Lancashire. The document helps define local authority spatial planning proposals, and is therefore used to guide South Ribble Borough Council's planning decisions.

12.16 The Core Strategy document makes mention of the requirement for biodiversity conservation in the following sections:

> *"10.21 A wide range of sites important to wildlife habitats and species exist in Central Lancashire, and whilst some areas/sites are afforded greater protection through legislation, the Core Strategy recognises the ecological value of all levels.*

10.23 The Core Strategy will help ensure that areas/sites with international, national and local designations will not be adversely affected by new development.

10.24 Design of the natural environment is equally important when considering the protection, maintenance, restoration and re-establishment and favourable condition of biodiversity and geodiversity. This can help to nurture and conserve habitat and species colonisation, and prevent fragmentation.

10.25 Ecological networks were introduced through national planning policies as an opportunity to design for the future of ecology through spatial planning. Policy 22 conforms to national guidance and will be further developed in future planning documents."

12.17 Core Strategy policies of relevance include:

"Policy 21: Landscape Character Areas - *New Development will be required to be well integrated into existing settlement patterns, appropriate to the landscape character type and designation within which it is situated and contribute positively to its conservation, enhancement or restoration or the creation of appropriate new features*.

Policy 22: Biodiversity and Geodiversity - *Conserve, protect and seek opportunities to enhance and manage the biological and geological assets of the area, through the following measures:*
(a) Promoting the conservation and enhancement of biological diversity, having particular regard to the favourable condition, restoration and re-establishment of priority habitats and species populations;
(b) Seeking opportunities to conserve, enhance and expand ecological networks;
(c) Safeguarding geological assets that are of strategic and local importance.

South Ribble Borough Council Local Plan 2015 (adopted July 2015)[viii]

12.18 The Local Plan (2012 – 2026) forms part of the Development Plan. It sets out the Borough Council's interpretation of the Central Lancashire Core Strategy including development management policies. Development policies of relevance to Cuerden Strategic Site include:

> Policy C4: Cuerden Strategic Site
> *Planning permission will be granted for development of the Cuerden Strategic Site subject to the submission of:*
> *a) an agreed Masterplan for the comprehensive development of Cuerden Strategic Site, to provide a strategic employment site, to include, employment, industrial and Green Infrastructure uses;*
> *b) a phasing and infrastructure delivery schedule;*
> *c) an agreed programme of implementation in accordance with the Masterplan and agreed design code.*
>
> Policy G16: Biodiversity and Nature Conservation
> *The borough's Biodiversity and Ecological Network resources will be protected, conserved and enhanced. The level of protection will be commensurate with Cuerden Strategic Site's status and proposals will be assessed having regard to Cuerden Strategic Site's importance and the contribution it makes to wider ecological networks:*
>
> *Regard will be had to:*
> - Protecting and safeguarding all designated sites of international, national, regional, county and local level importance including all Ramsar, Special Protection Areas, Special Areas of Conservation, national nature reserves, Sites of Special Scientific Interest and Biological Heritage Sites, Geological Heritage Sites, Local Nature Reserves, wildlife corridors together with any ecological network approved by the Council;
> - Protecting, safeguarding and enhancing habitats for European, nationally and locally important species;
> - When considering applications for planning permission, protecting, conserving and enhancing the borough's ecological network and providing links to the network from and/or through a proposed development site.
>
> *In addition development should have regard to the provisions set out below:*

a) The need to minimise impacts on biodiversity and providing net gains in biodiversity where possible by designing in wildlife and by ensuring that significant harm is avoided or, if unavoidable, is reduced or appropriately mitigated and/or, as a last resort, compensated;

b) The need to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations;

c) Where there is reason to suspect that there may be protected habitats/species on or close to a proposed development site, planning applications must be accompanied by a survey undertaken by an appropriate qualified professional;

d) Where the benefits for development in social or economic terms are considered to outweigh the impact on the natural environment, appropriate and proportionate mitigation measures and/or compensatory habitat creation of an equal or greater area will be required through planning conditions and/or planning obligations.

Central Lancashire Biodiversity and Nature Conservation Supplementary Planning Document 2015[ix]

12.19 The Central Lancashire Biodiversity and Nature Conservation SPD was drawn up in recognition of the important contribution that planning can make to improving biodiversity within Central Lancashire. The SPD provides guidance in relation to the Local Planning Regulations and the National Planning Policy Framework. Whilst not being a statutory part of the development plan, the SPD is afforded significant weight as a material consideration in determining planning applications. Its purpose is to provide guidance on the interpretation and implementation of the relevant Central Lancashire policies on biodiversity and to set out what is required as part of the planning application process.

12.20 The document draws upon and clarifies national and local legislation and planning policy particularly the NPPF and Local Plan. The SPD lays out the relevant policies from the above documents, which are not repeated here, as they are addressed in the relevant section of this report.

Legislation

12.21 In relation to significant habitats and protected species, key international and national legislation and policy includes:

- Wildlife and Countryside Act 1981 (as amended);[x]
- Countryside and Rights of Way Act 2000. Section 74 of the Act provides the habitat types and species of principal importance in England; [xi]

- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;[xii]
- The Protection of Badgers Act 1992;[xiii]
- The Natural Environment and Rural Communities (NERC) Act 2006; and[xiv]
- The Hedgerow Regulations 1997 [xv]

12.22 The United Kingdom (UK) Biodiversity Action Plan (BAP) was launched in 1994 (updated 2012) [xvi]with the main aim "…to conserve and enhance biological diversity within the UK, and to contribute to the conservation of global biodiversity through all appropriate mechanisms". The UK BAP comprises a series of Action Plans for 'priority' habitats and species, determined by their status as globally threatened or rapidly declining in the UK. The action plans outline measures required to conserve these priority habitats and species. The UK BAP lists a number of species as requiring conservation action, and consequently Species Action Plans (SAPs) have been developed for the conservation of these species. The UK BAP also lists a number of priority habitats that are of importance, for which Habitat Action Plans (HAPs) have been produced.

12.23 The national strategy for biodiversity is delivered at local level via Local Biodiversity Action Plans (LBAPs).

Assessment Methodology

Scope of the Assessment

12.24 The collection of baseline data, evaluation of ecological significance and assessment of impacts follows the guidance provided by the CIEEM,2016

- Description of baseline conditions summarising the desk study and field survey data reported in the individual technical ecological reports (Appendix 12.1);
- Identification of the Important ecological features;
- Assessment of nature conservation value/biodiversity importance of each Important ecological feature;
- Identification of activities that may have an impact on the valued ecological features;
- Assessment of impacts. This section provides a description of all significant impacts for each valued feature during the construction and operation of the Scheme;
- Determination of the significance of the residual effects on each ecological feature.

Area of study

12.25 The area of study has focussed on the Site and on the anticipated 'zone of impact' of the Development. The Development may have potential to affect ecological features outside the Site, and these are defined as the impacts arising within the zone of influence for any particular feature. The zone of influence (ZOI) varies according to the ecological feature assessed.

12.26 Data on ecologically important sites and species have been collated for an area of up to 2km from the Site.

12.27 The geographic area where significant ecological impacts could be predicted in relation to designated sites was selected in relation to the significance of those sites within potential zones of influence described in Table 12.1 below:

Table 12.1: Potential Zones of Influence for designated sites

Distance from site	Status
10km	Sites of International Importance, e.g. Special Areas of Conservation(SAC), Special Protection Area (SPA), Ramsar Site
2km	Sites of National or Regional Importance, e.g. Sites of Special Scientific Interest (SSSI)
1km	Sites of County Importance, i.e. County Wildlife Sites, and species records, eg. Protected, LBAP or notable species

12.28 Definition of the scope of the assessment at site level was based upon the proposal design and CIEEM guidelines for defining ZOI. The zone of influence for impacts upon habitats or species is defined by the ecological requirements of that feature and its place in ecosystem function rather than by setting generic defined geographic zones.

Consultations for Existing Biological Data

12.29 The following organisations / individuals were approached for existing information regarding Cuerden Strategic Site and surrounding area and their views sought and subsequently taken on board when designing surveys through the scoping exercise:

- Lancashire Environment Record Network (LERN);
- Lancashire County Council (Local Environmental Records Centre/Regionally Important Geological Sites);
- Lancashire Wildlife Trust; and
- Natural England.

12.30 A number of online resources were also searched for relevant records including:

- Multi Agency Geographic Information for the Countryside (MAGIC) website;
- The National Biodiversity Network (NBN) website; and
- Natural England's Nature on the Map www.natureonthemap.org.uk).

12.31 Consultation responses were provided and the comments made were taken into account when ensuring that sufficient attention was paid to the relevant ecological surveys and their assessment.

12.32 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and satellite imagery from Google Earth (www.maps.google.co.uk) were used in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

Collection of Baseline data: Field Survey

Surveys for Flora and Fauna

12.33 The surveys were based upon current guidance with reference made to the CIEEM, 2016 Guidelines for EcIA. These guidelines aim to give a degree of consistency in approach to evaluating the importance of the ecological features within Cuerden Strategic Site and any effects or impacts a scheme will have upon them.

12.34 Desk study and subsequent Extended Phase 1 Habitat Survey undertaken during the Spring months of 2022 and surveys previously undertaken by Simply Ecology (2012). Simply Ecology (2017) and Simply Ecology (2019) were updated as necessary. The extended Phase 1 informed the requirement for further detailed surveys which were undertaken to assess the likely presence, or otherwise, of European Protected Species (including bats and Great crested newt) as well as other protected species (including water vole, badgers and reptiles).

Habitats and Flora

12.35 Habitats within the survey area have been classified using the standard Phase 1 Habitat Survey methodology (JNCC, 2010). xviiTarget notes were used to record habitats or features considered as being of greatest nature conservation interest. Botanical species lists were compiled for each representative habitat and areas of particular botanical interest (if present within the Site). Hedgerows were assessed for importance under the wildlife and landscape criteria as set out in The Hedgerow Regulations 1997.

Fauna

12.36 Following initial site surveys and desk study scoping, detailed survey methodologies for fauna are provided in the species specific reports (See Appendix 12.1). The surveys comprised:

- Badgers;
- Bat Dusk of Potential Roost Features;
- Bat Activity Transects;
- Breeding bird Transects;
- Great crested newt (eDNA and Presence absence surveys);
- Otter;
- Water vole.

12.37 All methodologies followed published guidelines produced by The Bat Conservation Trust, The Environment Agency, Lancashire County Council, Natural England or CIEEM where seasonal constraints allowed.

- **Ecological Features**
-

12.38 CIEEM EcIA Guidelines indicate that detailed assessment should address those ecological features which are considered to be both important and potentially affected by the project. Detail of features that are widespread, unthreatened in the context of the Development, resilient to changes incurred and which will remain viable and sustainable do not require detailed assessment.

12.39 Therefore Important Ecological Features are defined at an early stage so that an assessment of impacts, and required mitigation, is relevant to the ecological value of the Site.

12.40 It should be noted that it has not been assumed that remaining ecological value is of no significance. All features of value have been assessed against potential impacts arising from the Development. The avoidance of significant harm to biodiversity is required by the NPPF, and is implicit in this assessment process as any impact upon biodiversity conservation objectives is considered to be 'significant' (CIEEM 2016), impacts however occur at different geographic scales and may be positive or negative.

12.41 The Planning Authority has a statutory duty under the NERC Act to have regard for conserving biodiversity and this can be delivered through a Construction Environmental Management Plan (CEMP). However this duty does not contain specific measures of compliance and cannot be used to define biodiversity conservation objectives.

12.42 For the purposes of defining biodiversity conservation objectives, this chapter references existing defined UK biodiversity lists including the UK BAP, habitats and species of principle importance defined in NERC Section 41 and local BAP and reference to the Lancashire Biological Heritage Site (BHS) Selection Guidelines (LCC,1998).[xviii]

12.43 The ecological features identified during the surveys and desk-top studies were set in the following contextual frames of reference:

- Geographical frame of reference (international, national, regional, county, borough or local importance);
- statutorily designated sites;
- Non-statutorily designated sites;
- Species of biodiversity value or significance, based on the UK Biodiversity Action Plan (UK Biodiversity Partnership 2012), or listed in Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC Act), which are considered to be of principal importance for the conservation of biodiversity in England, including legally protected or controlled species;

- Secondary or supporting value;
- Social and economic value.

Geographical context

12.44 The following criteria, based on geographical context and as recommended in the CIEEM guidelines for ecological impact assessment (CIEEM, 2016), are applied in the evaluation of the features identified in the baseline surveys and desk-top assessments:

- International;
- UK;
- National (England);
- Regional (Northwest England);
- County (Lancashire);
- District/Borough (South Ribble);
- Local or Parish (Cuerden);
- Within zone of influence of the Development only (Site).

12.45 The value of some features can be readily determined where they have been previously assigned a level of nature conservation value through statutory or non-statutory designation.

12.46 Other features, however, require an evaluation based on professional judgement in the context of the Site and its locality.

Designated sites

12.47 Sites of national importance for nature conservation may be notified as Sites of Special Scientific Interest (SSSI) by Natural England, although not all such sites are notified. Sites of international importance may be classified as Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites.

12.48 Sites of county importance for nature conservation may be selected as Biological Heritage Sites (BHS) by a partnership which includes Lancashire Wildlife Trust, Manchester & North Merseyside Wildlife Trust, Lancashire County Council and Natural England. Sites are selected according to published criteria. BHS are not protected by law but any impacts on them from a planning application are required to be considered when making a planning decision.

12.49 Sites of more local importance for nature conservation may be recognised as Local Nature Reserves (LNR) by the local authority.

12.50 Other designations include Sites of Invertebrate Significance, Ancient Woodland (as recorded on the Ancient Woodland Inventory) and Special Roadside Verges.

12.51 Lancashire BHS selection guidelines will be used in this assessment to help evaluate the importance of habitats at the Site LCC,1998).

12.52 Historical Lancashire BAP information and listings such as the Ancient Woodland Inventory or the Grassland Inventory can also help to assess its importance.

Species

12.53 Lists have been compiled for many species groups which identify those which are considered to be rare, scarce or threatened, based on a variety of criteria appropriate to the taxa involved. Some have statutory protection through their inclusion in schedules in the Wildlife and Countryside Act 1981 (as amended) or annexes in The Habitat Regulations (2019) as amended while some are listed as priority species in the UK BAP (amended in 2012) and are therefore included in the list of species in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

12.54 Lists which do not provide statutory protection include the list of Birds of Conservation Concern (Eaton et al 2021) xixand Red Data Books.

12.55 While these lists can be a useful indication of value, they should be used with caution. The CIEEM guidelines recommend that the inclusion of a species in a list of declining species is not in itself a sufficient criterion for assigning a level of value to the species because there can be many reasons for the decline in the species and the ecological value between different species can vary. Therefore species of Conservation Concern are also evaluated against local criteria to establish their significance in the Lancashire context.

12.56 The characteristics used to identify the nature conservation value of species, or features that may support species, include the following:

- Rarity at an international, national, county or more local scale;
- Presence of endemic or locally distinct sub-populations;
- Size of population in the geographical context (eg. notably large population);
- Species on the edge of their range;
- Species rich assemblages of plants or animals;
- Plant and animal communities considered to be typical of valued habitats;

- Ecosystems, habitat diversity, connectivity, mosaics and associations which provide important habitat for any of the above species or assemblages.

12.57 Table 12.2 summarises the Ecological Feature Evaluation by CIEEM, used by this study.

Social or economic value

12.58 Some habitats and species are of value to people, socially or economically, irrespective of their ecological value. Examples of social value may be recreational enjoyment, or a population of a species which gives particular pleasure to many people (e.g. a patch of bluebells or wild daffodils), while economic value may be assigned to populations of species with commercial value such as pheasant or fish, or the economic benefits from visitors to a site that attracts rare birds.

12.59 The social or economic value of habitats and species should be assessed separately from the ecological value of these features, and it is likely that sociologists or economists will need to be involved in the evaluation of such features.

Table 12.2: Summary of Ecological Feature Evaluation and Typical Descriptions

CIEEM Scale of Value	Example/Typical Description
Very high/ International	• An internationally designated site or candidate site (Special Protection Area (SPA), potential SPA, Special Areas of Conservation (SAC), candidate SAC, Sites of Community Importance, Ramsar site. • A sustainable 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 a larger whole • A sustainable population of an internationally important species. I.e. a UK Red Data Book species or species listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP) which is listed in Annex IV of the Habitats Directive, or as being of unfavourable conservation status in Europe, of uncertain conservation status or of global conservation concern in the UK BAP. Also sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements.
High/ National	• A nationally designated site (Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Marine Nature Reserve (MNR) or a discrete area which meets the selection criteria for national designation (e.g. SSSI selection guidelines) • A sustainable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat which are essential to maintain the viability of a larger whole

	• A sustainable population of a nationally important species or a site supporting such a species, i.e. a species listed on Schedules 5 & 8 of the 1981 WCA (as amended) which is a UK Red Data Book species (excluding scarce species) that is not listed as being of unfavourable conservation status in Europe, of uncertain conservation status or of global conservation concern in the UK BAP. A non-Red Data Book species that is listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP). Also sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements.
Medium-High/ Regional	• Sustainable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole • Sustainable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile • A population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation. Sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements. • Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.
Medium/ County / Metropolitan	• Semi-natural ancient woodland greater than 0.25 ha • County/Metropolitan sites and other sites which meet the ecological selection criteria for designation • A sustainable area of habitat identified in County BAP • A population of a species which is listed in a County/Metropolitan "red data book" or BAP on account of its regional rarity or localisation. Also sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements.
Medium-Low/District / Borough	• Semi-natural ancient woodland smaller than 0.25 ha. • Sustainable areas of habitat identified in a sub-County (District/Borough) BAP or in the relevant Natural Area profile • Sites/features that are scarce within the District/Borough or which appreciably enrich the District/Borough habitat resource. • A diverse and/ or ecologically valuable hedgerow network • A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation. Also sites supporting a breeding population of such a species or supplying a critical element of their requirements.
Low/ Parish / Neighbourhood	• Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood. E.g. species-rich hedgerows

Evaluating Impacts

12.60 This assessment assesses whether the Development is likely to have a significant impact on the ecological features identified during the baseline survey. A significant impact is defined as an impact on the integrity of a site or ecosystem and/or the conservation status of habitats and species within a given geographical area.

12.61 The process of impact assessment comprises:-

- Description of potential impacts pre-mitigation
- Description of mitigation proposed within the development proposals
- Identification of the potential for biodiversity enhancement within the proposed development
- Assessment of the residual impacts
- Identification of any additional mitigation required to compensate for any significant residual impacts
- Assessment of the significance of the impacts on biodiversity and the policy and legal implications.

12.62 This assessment follows the following format:

- Description of potential impacts and their characterisation in terms of direction (positive or negative), extent, magnitude, duration, reversibility and timing/frequency;
- Description of the mitigation which has been embedded into the proposals to minimise identified impacts and any additional mitigation or enhancement which is required;
- Assessment of the significance of the residual impacts following mitigation from an ecological, legal and policy perspective.

12.63 Impacts are considered with reference to the following parameters in accordance with the CIEEM guidelines, defined in Table 12.3 (after CIEEM 2016).

Table 12.3: Characterisation of impacts

Descriptor	Characterisation
Direction of impact	Positive of negative impact
Magnitude of impact	Level of severity of impact on feature

Descriptor	Characterisation
Extent of impact	Area / number affected and proportion of total area / population size
Duration of impact	Permanent or temporary; measured time interval and duration of
Reversibility of impact	Reversible or not reversible
Complexity of impact	Direct, indirect or cumulative
Frequency of impact	Constant or intermittent

12.64 In accordance with the Scoping Opinion (Appendix 2.2) and with accepted EIA practice based on case law, the potential impacts of the development are considered in this assessment, along with any in-combination effects from any other known projects.

12.65 Impacts may be direct or indirect, individual or cumulative, short, medium or long term, permanent or temporary and positive or negative.

Predicted Significant Effects

12.66 The assessment process requires that attention be paid to all likely forms of impact. These significant effects can vary in their form as they may be:

- Direct or indirect;
- Short or long-term;
- Intermittent, periodic or permanent;
- Cumulative and/or;
- Residual.

Mitigation, compensation and enhancement

12.67 Mitigation is an inherent part of impact assessment and is an iterative process undertaken as part of scheme design, whereby a whole mix of mitigation steps which ensure legal compliance and follow tried and tested best construction practice can be adopted to avoid significant impacts on sensitive features. These mitigation measures then become an embedded part of the design to avoid the impact, rather than being additional requirements to the design.

12.68 In this ES, the impacts of the scheme are described first in the absence of additional mitigation (other than those embedded mitigation features). This un-mitigated assessment is followed by the identification of appropriate mitigation measures and an assessment of the significance of the residual effects taking those mitigation measures into account.

12.69 It is important as part of any EIA, to clearly differentiate between mitigation, compensation and enhancement and these terms are defined here as follows:

- Mitigation is used to refer to measures to avoid, reduce or remedy a specific negative impact in situ. Mitigation is only required for negative effects assessed as being significant or where required to ensure compliance with legislation;
- Compensation is used to refer to measures proposed in relation to specific negative effects but where it is not possible to fully mitigate for negative effects in situ. Compensation is only required for negative effects assessed as being significant or where required to ensure compliance with legislation; and
- Enhancement is used to refer to measures that would result in positive ecological impacts but which do not relate to specific significant negative effects or where measures are required to ensure legal compliance.

12.70 In EIA it is only essential to assess and report significant effects. Any significant residual impacts and proposed compensatory measures must be weighed against any overriding public interest by LCC when deciding whether to determine the application.

Residual Effects

12.71 Finally, the residual effects are any adverse impacts that remain after the incorporation of avoidance and mitigation measures. In the context of ecological assessment, many avoidance and mitigation measures will be incorporated as an integral part of the scheme design. The design process has resulted in the Development being designed and modified to take account the need for ecological mitigation. This has enabled the extent and scale of the potential adverse effects to be continually reduced as part of the evolving Development design.

Baseline Conditions

Desk Study Results

Statutory Protected Sites

12.72 There are no statutory sites designated for nature conservation within the boundaries of the Site. However, there was one within the search radius of 2km: Preston Junction LNR (see Table 12.4). The LNR lies approximately 500m to the north of the Site.

12.73 The search was based upon an area radius of 10km for Natura2000 sites and 2km for nationally important and other sites.

Table 12.4: Statutory Biological Conservation Sites identified in the data search

Site Code and Name	Distance from Site	Status	Description	Features of interest
Preston Junction	0.6km	Local Nature Reserve	Abandoned railway cutting	• Semi-natural habitats • Birds • Butterflies

Non-statutory Sites

12.74 There is one non-statutory site within 2km of the site, Cuerden Valley Park and River Lostock Biological Heritage Site (BHS). The BHS lies approximately 500m to the north and west of the Site.

12.75 Table 12.5 (below) contains details of all non-statutory sites designated on ecological criteria found within the survey area (2km radius of the application site).

Table 12.5: Non Statutory Biological Conservation Sites identified in the data search

Site Code and Name	Distance from Site	Status	Description	Notified Selection Criteria
Cuerden Valley Park and River Lostock	0.5km	Notified Biological Heritage Site	Ancient and secondary woodland, with flushed, neutral and marshy grasslands	• Woodland & scrub. • Grassland. • Habitat mosaics. • Dragonflies & damselflies. • Molluscs. • Birds.

Species and species groups

12.76 Data returned during the desk study included a number of protected or notable species within 2km of the Site. It is noted that the absence of records of other flora and fauna does not necessarily discount the possibility of protected species being on The Site or in the vicinity.

12.77 Datasets provided by LERN, Preston Naturalists Union and NBN are shown below (see Table 12.6, 12.7 and 12.8:

Table 12.6: Protected species identified within 1km of the Site from LERN records

Latin Name	Common Name	Taxon Group
Rana temporaria	Common Frog	amphibian
Bufo bufo	Common Toad	amphibian
Triturus cristatus	Great Crested Newt	amphibian
Lissotriton helveticus	Palmate Newt	amphibian
Lissotriton vulgaris	Smooth Newt	amphibian
Tyto alba	Barn Owl	bird
Fringilla montifringilla	Brambling	bird
Loxia curvirostra	Common Crossbill	bird
Turdus pilaris	Fieldfare	bird
Bucephala clangula	Goldeneye	bird
Tringa ochropus	Green Sandpiper	bird
Falco subbuteo	Hobby	bird
Alcedo atthis	Kingfisher	bird
Charadrius dubius	Little Ringed Plover	bird
Falco columbarius	Merlin	bird
Falco peregrinus	Peregrine	bird
Turdus iliacus	Redwing	bird
Salmo salar	Atlantic Salmon	bony fish (Actinopterygii)
Thymallus thymallus	Grayling	bony fish (Actinopterygii)
Hyacinthoides non-scripta	Bluebell	flowering plant
Satyrium w-album	White-letter Hairstreak	insect - butterfly
Pyrenula hibernica	Oil-stain parmentaria	lichen
Natrix helvetica	Grass Snake	reptile
Anguis fragilis	Slow-worm	reptile
Chiroptera	Bats	terrestrial mammal

Latin Name	Common Name	Taxon Group
Myotis brandtii	Brandt's Bat	terrestrial mammal
Plecotus auritus	Brown Long-eared Bat	terrestrial mammal
Pipistrellus pipistrellus	Common Pipistrelle	terrestrial mammal
Myotis daubentonii	Daubenton's Bat	terrestrial mammal
Sciurus vulgaris	Eurasian Red Squirrel	terrestrial mammal
Lutra lutra	European Otter	terrestrial mammal
Arvicola amphibius	European Water Vole	terrestrial mammal
Nyctalus noctula	Noctule Bat	terrestrial mammal
Nyctalus/Eptesicus agg.	Nyctalus/Eptesicus agg.	terrestrial mammal
Pipistrellus pipistrellus	Pipistrelle	terrestrial mammal
Pipistrellus	Pipistrelle Bat species	terrestrial mammal
Mustela putorius	Polecat	terrestrial mammal
Pipistrellus pygmaeus	Soprano Pipistrelle	terrestrial mammal
Myotis	Unidentified Bat	terrestrial mammal
Myotis mystacinus	Whiskered Bat	terrestrial mammal

Table 12.7: Bird records identified from the local area from The Preston Naturalists Union

Latin Name	Common Name	Observations
Latin Name	Common Name	Observations
Anser anser	Greylag Goose	Cuerden Valley Lake. Odd sightings through 1980s. 1997 flock of 50+
Branta canadensis	Canada Goose	Cuerden Valley Lake. Small numbers increasing. Peak 1994 & 1998 when flocks of 150 were seen
Anas penelope	Wigeon	Cuerden Valley Lake. One pair in 1987
Anas crecca	Teal	Cuerden Valley Lake. One record of 4 birds in 1987
Anas platyrhynchos	Mallard	Cuerden Valley Lake. Regular & Common

Latin Name	Common Name	Observations
Anas clypeata	Northern Shoveller	Cuerden. 3 seen flying in 1982
Aythya ferina	Common Pochard	Cuerden Valley Lake. Regular
Anas fuligula	Tufted Duck	Cuerden Valley. Regular low numbers
Aythya marila	Greater Scaup	Cuerden Valley Lake. v. rare
Mergus merganser	Goosander	Cuerden Valley Lake. 2 records from 1990s
Oxyura jamaicensis	Ruddy Duck	Cuerden Valley Lake. 1 record 1990
Perdix perdix	Grey Partridge	Cuerden Valley. recorded <10 throughout 1980s & 90s
Tachybaptus ruficollis	Little Grebe	Cuerden Valley Lake. Regular low numbers
Podiceps cristatus	Great Crested Grebe	Cuerden Valley Lake. Regular
Ardea cineria	Grey Heron	Cuerden Valley Lake. Regular
Rallus aquaticus	Water Rail	Cuerden Valley Park. Occasional
Gallinula chloropus	Moorhen	Cuerden Valley Lake. Regular
Fulica atra	Coot	Cuerden Valley Lake. Regular
Larus cachinnans	Yellow-legged Gull	Cuerden Valley. 1 record 1998
Sterna hirundo	Common Tern	Cuerden. A few records from 1980s
Uria aalge	Guillemot	Cuerden Valley. 1 record 1993
Columba palumbus	Woodpigeon	Cuerden Valley Park. Regular & Common
Cuculus canorus	Cuckoo	Cuerden Valley Park. Records up to mid 1980s. Occasionally heard.
Strix aluco	Tawny Owl	Cuerden Valley Park. Regular. Last record 2004
Alcedo atthis	Kingfisher	Cuerden Hall & R. Lostock. Regular low numbers
Picus viridis	Green Woodpecker	Cuerden Valley. Regular
Dendrocopos major	Great Spotted Woodpecker	Cuerden Valley. Regular & Common
Dendrocopos minor	Lesser Spotted Woodpecker	Cuerden Valley. Records from early 1980s

Latin Name	Common Name	Observations
Delichon urbica	House Martin	Cuerden Valley. Regular & Common
Anthus trivialis	Tree Pipit	Cuerden Valley. 1 record mid-1980s
Motacilla cinerea	Grey Wagtail	Cuerden Valley Lake. Regular & Common
Cinclus cinclus	Dipper	Cuerden Valley & R. Lostock. Regular low numbers
Turdus philomelos	Song Thrush	Cuerden Valley. Regular
Turdus iliacus	Redwing	Cuerden Valley. Regular high numbers
Turdus viscvorus	Mistlethrush	Cuerden Valley. Regular
Acrosephalus schoenbaenus	Sedge Warbler	Cuerden Valley. Low numbers 1980s & 90s
Sylvia borin	Garden Warbler	Cuerden Valley. Low numbers 1980s & 90s
Sylvia communis	Whitethroat	Cuerden Valley. Regular low numbers
Phylloscopus inornatus	Wood Warbler	Cuerden Valley. Low numbers 1980s & 90s
Phylloscopus trochilus	Willow Warbler	Cuerden Valley. Regular
Muscicapa striata	Spotted Flycatcher	Cuerden Valley. Low numbers 1980s
Ficedula hypoleuca	Pied Flycatcher	Cuerden Valley. 1 record mid-1980s
Aegithalos caudatus	Long-tailed Tit	Cuerden Valley. Regular & Common
Parus major	Great Tit	Cuerden Valley. Regular & Common
Parus ater	Coal Tit	Cuerden Valley. Regular low numbers
Parus montanus	Willow Tit	Cuerden Valley. Low numbers 1980s
Sitta europaea	Nuthatch	Cuerden Valley. Regular
Garrulus glandarius	Jay	Cuerden Valley. Regular & Common
Pica pica	Magpie	Cuerden Valley. Regular & Common
Corvus monedula	Jackdaw	Cuerden Valley. Regular & Common
Corvus frugilegus	Rook	Cuerden Valley. Regular & Common

Latin Name	Common Name	Observations
Corvus corone corone	Carrion Crow	Cuerden Valley. Regular & Common
Corvus corax	Raven	Cuerden Valley. 1 record 2005
Sturnus vulgaris	Starling	Cuerden Valley.
Passer montanus	Tree Sparrow	Cuerden Valley Park.
Fringilla montefringilla	Brambling	Cuerden Valley Park.
Carduelis chloris	Greenfinch	Cuerden Valley Park.
Carduelis carduelis	Goldfinch	Cuerden Valley Park. Low numbers 1980s & 90s
Carduelis spinus	Siskin	Cuerden Valley Park. Regular
Carduelis cannabina	Linnet	Cuerden Valley Park. Regular
Carduelis cabaret	Lesser Redpoll	Cuerden Valley Park. Occasional
Pyrrhula pyrrhula	Bullfinch	Cuerden Valley Park. Regular low numbers
Coccothraustes coccothraustes	Hawfinch	Cuerden Hall. Low numbers up to 1987
Emberiza citrinella	Yellowhammer	Cuerden Valley. Regular low numbers
Emberiza schoeniclus	Reed Bunting	Cuerden Valley. Regular low numbers

Table 12.8: NBN species records

Latin Name	Common Name	Taxon group
Bufo Bufo	Common Toad	Amphibian
Triturus cristatus	Great Crested Newt	Amphibian
Anthus trivialis	Tree Pipit	Bird
Alauda arvensis	Skylark	Bird
Carduelis cannabina	Linnet	Bird
Carduelis cabaret	Lesser Redpoll	Bird
Coccothraustes coccothraustes	Hawfinch	Bird
Emberiza citrinella	Yellowhammer	Bird

Latin Name	Common Name	Taxon group
Emberiza calandra	Corn Bunting	Bird
Emberiza schoeniclus	Reed Bunting	Bird
Locustella naevia	Grasshopper Warbler	Bird
Muscicapa striata	Spotted Flycatcher	Bird
Numenius arquata	Eurasian Curlew	Bird
Passer domesticus	House Sparrow	Bird
Passer montanus	Tree Sparrow	Bird
Phylloscopus sibilatrix	Wood Warbler	Bird
Pyrrhula pyrrhula	Bullfinch	Bird
Streptopelia turtur	Turtle Dove	Bird
Turdus philomelos	Song Thrush	Bird
Vanellus vanellus	Northern Lapwing	Bird
Anguilla anguilla	European Eel	Bony fish
Salmo trutta	Brown Trout	Bony fish
Ajuga chamaepitys	Ground Pine	Higher plant
Carum carvi	Caraway	Higher plant
Dactylorhiza viridis	Frog Orchid	Higher plant
Fumaria purpurea	Purple Ramping-fumitory	Higher plant
Platanthera bifolia	Lesser Butterfly-orchid	Higher plant
Stellaria palustris	Marsh Stitchwort	Higher plant
Boloria euphrosyne	Pearl-Bordered Fritillary	Butterfly
Boloria selene	Small Pearl-Bordered Fritillary	Butterfly
Coenonympha tullia	Large Heath	Butterfly
Lasiommata megera	Wall Brown	Butterfly

Latin Name	Common Name	Taxon group
Satyrium w-album	White-letter Hairstreak	Butterfly
Nigrobaetis niger	Southern Iron blue	Moth
Acronicta rumicis	Knot-grass	Moth
Amphipyra tragopoginis	Mouse Moth	Moth
Apamea anceps	Large Nutmeg	Moth
Asteroscopus sphinx	The Sprawler	Moth
Atethmia centrago	Centre-barred Sallow	Moth
Chesias legatella	The Streak	Moth
Dasypolia templi	Brindled Ochre	Moth
Diarsia rubi	Small Square-spot	Moth
Ecliptopera silaceata	Small Phoenix	Moth
Ennomos fuscantaria	Dusky Thorn	Moth
Eugnorisma glareosa	Autumnal Rustic	Moth
Eulithis mellinata	Spinach	Moth
Hepialus humuli	Ghost Moth	Moth
Hydraecia micacea	Rosy Rustic	Moth
Melanchra persicariae	Dot Moth	Moth
Mythimna comma	Shoulder-striped Wainscot	Moth
Orthonama vittata	Oblique Carpet	Moth
Scotopteryx chenopodiata	Shaded Broad-bar	Moth
Spilosoma lubricipeda	White Ermine	Moth
Trichiura crataegi	Pale Eggar	Moth
Tyria jacobaeae	Cinnabar Moth	Moth
Watsonalla binaria	Oak Hook-tip	Moth
Xanthia gilvago	Dusky-lemon Sallow	Moth

Latin Name	Common Name	Taxon group
Xanthia icteritia	Sallow	Moth
Xanthorhoe ferrugata	Dark-barred Twin-spot Carpet	Moth
Zootoca vivipara	Common Lizard	Reptile
Arvicola amphibius	Water Vole	Mammal
Lepus europaeus	Brown Hare	Mammal
Lutra lutra	Otter	Mammal
Nyctalus noctula	Noctule Bat	Mammal
Pipistrellus pipistrellus	Common Pipistrelle	Mammal

Habitats

12.78 The Site largely comprises of semi-improved agricultural grassland with hedgerows and scattered trees which divide the Site into numerous fields. A Phase 1 Habitat Plan is shown in the PEA report Appendix 12.1 along with accompanying Target Notes. The following table (Table 12.9) represents the habitats which were recorded at the Site. It should be noted the Site boundary was mapped to the inside (Site side) of boundary hedges. Internal field areas were mapped to the edge of hedge canopies. Linear habitats comprising internal hedges utilise an area of 0.91ha. Bare ground has been used as a proxy for the hedge bottoms in order that areas post development are comparable pre and post development. It should be noted that for Biodiversity Net Gain (BNG) calculations, habitats on site were taken as of 2017, prior to partial implementation of an existing planning consent on the Site. The areas and lengths shown in Table 12.9 therefore differ for the BNG calculations.

Table 12.9: Habitats within The Site

Habitat Type	Amount of resource in Ha
Bare Ground	2.68
Hedge Bottom	0.91
Cultivated/Disturbed Land - Ephemeral/short	0.22
Improved Grassland	1.52
Neutral Grassland - Semi-improved	33.05
Marginal and inundation - Inundation vegetation	0.18
Standing Water	0.07
Tall Herb and Fern - Other Tall Ruderal	1.45
Marsh/Marshy Grassland	4.69
Scrub - Dense/continuous	2.63
Woodland - Broad-leaved Semi-Natural	0.13
Scattered Trees	No Area
Total	47.53Ha

Dry Ditch	1183
Hedge and Trees - >Native Species-rich	400
Hedge and Trees - >Species-poor	1818
Intact Hedge - >Species-poor	2269
Running Water	422
Total	6092m

Bare ground and Cultivated/Disturbed Land - Ephemeral/short perennial

12.79 12.79 These habitats result from past development of the site under a previous planning application. Bare compacted gravels forming access roads and earth bunds of stockpiled earth. The base of hedgerows has also been mapped as bare ground in order to ensure post development areas match pre-development.

12.80 Valuation: These habitats are considered to be of value at the local Site level only.

Improved Grassland

12.81 One field within the Site had been re-sown as an improved pasture. This was a field adjacent to the A5083 in the western part of The Site.

12.82 This habitat was the least botanically diverse within the entire Site. The sward had been re-seeded with an agricultural grass mix dominated by perennial rye-grass and Yorkshire fog, with some wet areas supporting abundant marsh fox-tail. Creeping buttercup, common mouse-ear and white clover comprised the remainder of this species-poor sward.

12.83 Valuation: This habitat type was limited in extent within the Site and all species were common and widespread, as typical for this habitat type. Situated in the context of a grassland dominated Site, and displaying low diversity in relation to the extensive semi-improved resource locally, this habitat type is considered to be of value at the Local level only.

Neutral Grassland Semi-improved

12.84 Semi-improved permanent pasture used for a mixture of sheep, cattle or horse grazing or silage production was the vastly predominant land-use across the entire Site.

12.85 The species diversity of the numerous fields was rather uniform and only moderately diverse. A variety of grasses co-dominated in the sward, with typical species encountered being: abundant Yorkshire fog, common bent, sweet vernal grass, meadow fox-tail and red fescue, with frequent perennial rye-grass and marsh fox-tail, and common and glaucous sweet-grasses in damp areas. The forbs were particularly restricted, typically with only abundant creeping buttercup, frequent meadow buttercup and a lesser amount of white clover, common sorrel and broad-leaved dock being widely encountered. The weed species ragwort was also common.

12.86 Valuation: Neutral grasslands that are considered to meet the priority habitat definition are those which show only limited signs of agricultural improvement. These are typically species-rich examples of grassland which have a high nature conservation importance, or other grassland areas that have lost some botanical diversity but nevertheless are restorable to such species-rich habitat.

12.87 The semi-improved grassland within the Site supports a limited diversity and low frequency of herbs (and very few of those which are indicative of diverse grassland), and is therefore not considered to qualify as the priority habitat. The semi-improved grasslands within the Site are not considered to meet the selection criteria described in the NERC Habitats of Principle Importance definition, or the Lancashire Biological Heritage Site Selection Guidelines.

12.88 The species-poor semi-improved grassland habitat and plant assemblages recorded on the Site are considered to be of value only at the Site level. Neither the habitat nor the plant assemblages present are limited within the wider environment and neither are they exceptional examples of their type. The nature of the grassland was classed as 'poor' semi-improved as the diversity and abundance of plant species in the sward was low. No priority species or other notable plant species were observed.

12.89 Part of the grassland is within the Lancashire Grassland Network 3km Corridor. This is considered to be at Borough level value.

Standing Water and Marginal and inundation - Inundation vegetation

12.90 Within the Site were three ponds. Reference to historical mapping reveals that several of the ponds have formed on the location of former sand pits dating from the 19th century.

12.91 Small areas of Inundation vegetation were associated with a pond which has dried up.

12.92 Valuation: The ponds on Site are generally of low ecological value, having poor development of aquatic and marginal flora, appearing to be semi-ephemeral and not meeting the BHS selection guidelines.

12.93 No GCN were recorded but Common Toad, Common Frog, and Smooth Newt have been recorded t. Common Toad is UK BAP species and as such the Ponds would be classified as a BAP habitat but are valued at the Borough level.

Tall Ruderal vegetation

12.94 There was only a small area of the Site supporting this habitat. The area was disturbed ground which had become dominated by false oat-grass, nettle, broad-leaved dock, ragwort and rosebay willowherb.

12.95 Valuation: This habitat type was limited in extent within Site and all species were common and widespread, and typical for this habitat type, however it does provide some habitat that can be used by local wildlife and increases the diversity of the local area. This habitat type is therefore only considered to be of value at Site level.

Marshy Grassland

12.96 The principal area of this habitat has formed on land which was formally wooded and has been felled. Species diversity is poor. Smaller areas occur within the neutral grassland as a result of impeded drainage as well as a larger area to the south of the Site. The species composition lacks indicator species for the BAP habitat Purple Moorgrass and Rush Pasture. This sub-community is less well-defined and is essentially a transition between M23a and the Holcus lanatus – Juncus effusus rush-pasture (MG10). The marshy grassland present is not a UK BAP habitat but is part within the Lancashire Grassland Ecological Network. Of note the largest area of marshy grassland, in the area formally a wood, is excluded from the Lancashire Grassland Ecological Network. It is likely the mapping of the Lancashire Grassland Ecological Network pre-dated loss of the woodland.

12.97 Valuation: The marshy grassland habitat and constituent plant assemblages recorded on Site are considered to be of value at the Site level. The vegetation was not floristically diverse, predominantly dominated by soft rush and common grasses. None of the habitat on the Site represents an exceptional example of the type and no priority species or other notable plant species were observed.

12.98 Part of the grassland is within the Lancashire Grassland Network 3km Corridor. This is considered to be at Borough level value.

Scrub

12.99 There was dense scrub to the sides of the M65. This is well established and dense.

12.100 Valuation: This habitat type was limited in extent within Site and all species were common and widespread, and typical for this habitat type, however it does provide some habitat that can be used by local wildlife and increases the diversity of the local area. This habitat type is therefore only considered to be of value at Site level.

Woodland - Broad-leaved Semi-Natural

12.101 A small area of woodland occurs around a pond on the boundary of the site. This is poorly fenced out from the adjacent fields and the understory is poorly developed. Trees are mature and this is a UK BAP Habitat. This woodland would be classified as a Lancashire BAP Habitat. This woodland is not within the Lancashire Woodlands Network.

12.102 Valuation: This habitat type was limited in extent within Site and all species were common and widespread, and typical for this habitat type, however it does provide some habitat that can be used by local wildlife and increases the diversity of the local area. This habitat type is therefore only considered to be of value at local level.

Scattered Trees

12.103 The field boundaries within the Site are associated with a great many trees which are present as single standards or as a near-continuous over-storey along the hedgerows. The scattered trees are present in all parts of the Site except the north where the boundaries to the M65 and the A582 have been modified and re-planted. This pattern of mature hedge trees across most of the Site was evident in mapping from 1848 and is evidence that hedge and scattered trees has been part of the local landscape for many years. Over the years some additional loss of scattered trees has occurred as fields have been expanded through boundary hedge removal.

12.104 The most abundant tree species were pedunculate oak and sycamore, with these two species comprising virtually all trees recorded except for the occasional alder and holly. Most of the scattered trees were mature. Regular mechanical maintenance of the hedges alongside the roads has caused a lack of recruitment of new trees. Elsewhere on Site many of the hedges and scattered trees did not appear subject to regular management. This has resulted in mature tree-lines with overshot and often gappy over-mature hedges.

12.105 Valuation: The mature trees were present throughout within the Site area. All species were common and widespread. There were occasional veteran trees. This somewhat isolated scattered tree habitat can nevertheless be used by local wildlife such as invertebrates, bats and birds, and increases the overall diversity of the local area. This habitat type is considered to be of value at the local level.

Running Water

12.106 Only one permanently flowing watercourse was present within the Site.

12.107 The small un-named stream flowed within a ditch which ran from east to west across the Site. The shallow stream was no more than 1m wide and 30cm deep and had sluggish flowing water. The streambed was sandy with few stones. Bankside flora comprised abundant swathes of bracken, rosebay willowherb, nettle, bramble, ragwort and creeping thistle. Wild angelica was frequent and foxglove, meadowsweet and red campion were occasional. Very little open water was visible and the overhanging vegetation was dense. In the channel was abundant reed canary grass with large stands of fools watercress and clumps of soft rush and brooklime with frequent marsh willowherb.

12.108 Valuation: Running water on Site does not qualify as a NERC Habitat of Principle Importance when assessed against the eligibility criteria (as defined by the UKBAP Priority Habitat description). Running water is a LBAP habitat. The overall habitat quality is considered of value at the Site level.

Hedgerows

12.109 Hedge reference numbers were duplicated from Simply Ecology (2012). Due to the large size of the site and its agricultural land-use, there were a considerable number of hedges forming the field boundaries on the site. Hedges were classified as 'species rich' if they had five of more native woody species averaged along the 30m assessed lengths. 400m of species rich hedge were mapped.

12.110 Principally these hedges are to the Southern area of the site and comprise tall, gappy hedgerows with a large number of mature as well as veteran trees.

12.111 Hedge R was classified as important under the Hedgerow regulations and runs along Stoney Lane. The calculations for hedgerow regulations assessment as well as hedge lengths are appended.

Flora

12.112 No notable plant species were recorded in data search or field survey. The only protected plant species record was for bluebell, which is protected through general provisions in the WCA 1981 (as amended) which make it illegal to intentionally uproot a wild plant. Himalayan Balsam (Impatiens glandulifer) was noted along some of the hedgerows.

Habitats Survey Summary

12.113 The focus for conservation of habitats and associated biodiversity in the UK is provided by the list of 56 Habitats of Principle Importance under Section 41 of the NERC Act (2006).

12.114 Field surveys identified the presence of two Priority Habitats within the Site (see Table 12.10). These were:

- Ponds which support common amphibian species including Common Toad.

- Hedgerows on site meet the broad definition of priority hedgerows, as they meet the criterion of >80% native woody species composition. This is a very broad category and the priority habitat description recognises that the definition will include 84% of UK hedgerows. When assessed for ecological value it is clear that the hedgerows are not particularly species rich and do not contain notable species. One section of hedgerow is of higher value as it meets the 'important' hedge definition under the Hedgerow Regulations (1997).

Table 12.10: Habitats of high ecological value

High Ecological Value Habitats Present	Relevant Legislation
Hedgerow	Natural Environment and Rural Communities Act – Section 41 – 2006: Habitats of Principle Importance. Hedgerow Regulations: Important Hedgerows
Ponds which support Common Toad (A UK BAP Species)	NERC (2006): Habitats of Principle Importance

Species Survey Results

12.115 The faunal nature conservation interest of the Site was collected using a range of species specific surveys as identified through the scoping exercise and subsequently conducted in accordance with methods provided in Appendix 12.1, which are methods accepted by CIEEM.

Great crested newts

12.116 Simply Ecology (2012) report the survey area contained 22 potential newt ponds but the referenced plan shows only 21 ponds. These were all re-assessed in the spring of 2022. The majority had been lost or were dry with no indication of prolonged waterlogging. This is due to changes in site drainage, ground works undertaken under a previous planning consent and mineral extraction.

12.117 The high quality terrestrial habitat around the ponds on site, without barriers to dispersal from the quarry, would result in the presence of this species on site should it also occur in the quarry.

12.118 In Spring 2022 ten ponds were located which were potentially suitable for GCN. The same numbering convention has been used as Simply Ecology (2012). Ponds 4 and 5 and Ponds 14 and 15 are connected and as such were treated as a single pond. All ponds were eDNA tested. Ponds 1-5 and 16 and 20 on the 15th April 2022 and Ponds 14, 15 and 17 on the 24th April 2022.

12.119 Pond 4 and 5 appear likely to dry out in summer and are heavy vegetated. Pond 16 is heavily shaded by overhanging trees and has limited aquatic vegetation associated with it. Infrequent drying out is also likely.

12.120 All ponds tested NEGATIVE for GCN eDNA.

12.121 Simply Ecology (2012) report Smooth Newt, Common Frog and Common Toad from Ponds 1-5 and 13- 16 and 20. Common Toad were recorded in Ponds 1-3, 11,15, 16 and 20. Simply Ecology (2017) report Common Toad from Pond 15 but the absence of other amphibians from ponds 10 and 12. Pond 1-5, 14, 15, 16 and 20 were still present on or near the site in 2022. Given the good terrestrial connectivity between ponds, it is reasonable to conclude populations of these species are still present on and around the site. Tadpoles were recorded in Pond 16, 17 and 20. Tadpoles in Pond 16 appeared black, and well developed, suggesting they are from Common Toad.

12.122 Common Toad is a Species of Principle Importance; there is a high degree of habitat fragmentation outside the Site boundary and as such is valued at the Parish level.

Bats

12.123 Bats are fully protected under Schedule 5 of the WCA 1981 (as amended) and Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

12.124 Surveys by Simply Ecology (2012) and Simply Ecology (2019) and again in May 2022 as well as tree inspections for bat roosting potential revealed trees of a wide age range across the Site, though the species diversity was low. The trees were distributed predominantly along roadsides and field boundaries, most notably along Stoney Lane and along boundaries in the south west of the Site.

12.125 Of the trees surveyed none were found to contain bat roosts and were categorised either risk level 2 or 3.

12.126 No roosts in any of these trees was confirmed, nor any evidence seen of bats using the trees. Therefore all categorisation was designated based solely upon an assessment of the potential of the trees rather than from direct evidence. Assessed trees and risk categories are included with the Ecological Appraisal (see Appendix 12.1).

12.127 Despite intensive survey effort the combination of tree-climbing endoscope surveys as well as emergence, transects and dawn surveys did not confirm the location of any bat roosts within Site.

12.128 Historic surveys Simply Ecology (2012) and Simply Ecology (2019) and the more recent update in May 2022 found regular and consistent patterns of low level bat activity were found within the Site. The surveys detected bats consistently using the Site all through the night. Based upon the direct observational evidence of the dawn surveys by Simply Ecology (2012) it was concluded that these bats were roosting outside the Site and commuting into and away from the Site each evening for foraging.

12.129 Apart from pipistrelles, some limited activity of following bat species was also present at The Site; noctule, brown long-eared and unknown Myotis spp.

12.130 It was concluded that the Site does not support a large or diverse population of bats either for feeding or roosting. However Stoney Lane does represent a locally valuable commuting flight for bats crossing the Site. The overall low levels of bat activity are likely to be due to a combination of the urban-edge setting of the Site and low habitat suitability. The linear hedgerows which run parallel to each other and the largely short sward grassland combined with a lack of woodland will only sustain limited invertebrate populations upon which to forage. This explains the presence of pipistrelles but few other bat species. Nonetheless, the Site does have value for small numbers of bats, and overall the entire Site supports several tens of bats at any one time.

12.131 Valuation: Bats are notionally judged to be of National value as the species receives legal protection under the Wildlife and Countryside Act 1981 (as amended) and Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Some species are UK BAP Priority Species or listed in Annex II of the Habitats Directive. However, the Site has low value for bat species illustrated by the scarcity of bat foraging and bat flight paths encountered within the Site. It is likely that these low levels of activity reflect the impact of wider intensive agricultural and urban land use upon bat populations. Notwithstanding, we judge bats to be of Borough level importance as they were present along suitable linear habitat features. This judgement takes into account the lack of any roosts at the Site.

Breeding Birds

12.132 The survey methodology employed during 2012 and 2019 bird survey visits was based upon the Common Bird Census (CBC) devised by the British Trust for Ornithology (BTO) Marchant (1983). xxTwo surveys had been undertaken in the 2022 season by early May but these are insufficient to conclude the survey results from 2012 and 2019 are no longer valid. The 2012 and 2019 assessment criteria are therefore carried forward pending additional survey information providing alternative conclusions.

12.133 Breeding status was established following the criteria below:

- Probable breeder - Evidence accumulated during the survey indicates that the bird species is breeding on the landholding.
- Confirmed breeder - An active nest was observed or equivalent.
- Non Breeder – Seen but either flying over and/or no suitable habitats for breeding.

12.134 Over the course of the breeding bird surveys 50 species were identified using the Site. Up to 41 of these species are confirmed or possible breeders. These are listed in the Table 12.11a and Table 12.11b, which includes the BTO/RSPB 'traffic light' status indicating that they are birds of conservation concern. Note, the barn owl (Tyto alba) was added to the list when a bird was observed foraging during night time bat surveys.

12.135 Simply Ecology (2019) do not report the breeding status of birds in the 2019 surveys.

Table 12.11a: Birds recorded as being present at the Site 2012

Common Names	Latin Name	BTO Species code	Conservation Status	Breeding & Nesting Habitat†	Breeding Status on Site*
Grasshopper Warbler	Locustella naevia	**GH**	**Red**	**T**	**Non breeder**
House Sparrow	Passer domesticus	**HS**	**Red**	**T/B**	**Probable**
Lapwing	Vanellus vanellus	**L.**	**Red**	**G**	**Non Breeder**
Marsh Tit	Poecile palustris	**MT**	**Red**	**T**	**Non Breeder**
Song Thrush	Turdus philomelos	**ST**	**Red**	**T**	**Probable**
Starling	Sturnus vulgaris	**SG**	**Red**	**T/B**	**Probable**
Yellowhammer	Emberiza citrinella	**Y.**	**Red**	**T**	**Confirmed**
Black Headed Gull	*Chroicocephalus ridibundus*	**BH**	**Amber**	**G**	**Non Breeder**
Bullfinch	*Pyrrhula pyrrhula*	**BF**	**Amber**	**T**	**Probable**

Common Names	Latin Name	BTO Species code	Conservation Status	Breeding & Nesting Habitat†	Breeding Status on Site*
Common Kestrel	*Falco tinnunculus*	**K.**	**Amber**	**T/B**	**Probable**
Dunnock	*Prunella modularis*	**D.**	**Amber**	**T**	**Confirmed**
House Martin	*Delichon urbica*	**HM**	**Amber**	**B**	**Probable**
Lesser Black backed Gull	*Larus fuscus*	**LB**	**Amber**	**G**	**Non Breeder**
Mallard	*Anas platyrhynchos*	**MA**	**Amber**	**G/T**	**Probable**
Meadow Pipit	*Anthus pratensis*	**MP**	**Amber**	**G**	**Non Breeder**
Snipe	*Gallinago gallinago*	**SN**	**Amber**	**G**	**Non Breeder**
Tawny Owl	*Strix aluco*	**TO**	**Amber**	**T**	**Confirmed**
Willow Warbler	*Phylloscopus trochilus*	**WW**	**Amber**	**T**	**Confirmed**
Barn Owl	*Tyto alba*	**BO**	**Green**	**B/T**	**Non Breeder**
Blackbird	*Turdus merula*	**B.**	**Green**	**T**	**Confirmed**
Blackcap	*Sylvia atricapilla*	**BC**	**Green**	**T/B**	**Probable**
Buzzard	*Buteo buteo*	**BZ**	**Green**	**T**	**Probable**
Carrion Crow	*Corvus corone*	**C.**	**Green**	**T**	**Probable**
Chaffinch	*Fringilla coelebs*	**CH**	**Green**	**T**	**Confirmed**
Chiffchaff	*Phylloscopus collybita*	**CC**	**Green**	**G/T**	**Probable**
Coal Tit	*Periparus ater*	**CT**	**Green**	**T**	**Confirmed**
Collared Dove	*Streptopelia decaocto*	**CD**	**Green**	**T**	**Probable**
Goldcrest	*Regulus regulus*	**GC**	**Green**	**T**	**Probable**
Goldfinch	*Carduelis carduelis*	**GO**	**Green**	**T**	**Probable**
Great Spotted Woodpecker	*Dendrocopos major*	**GS**	**Green**	**T**	**Probable**
Greenfinch	*Carduelis chloris*	**GR**	**Green**	**T**	**Probable**
Jackdaw	*Corvus monedula*	**JD**	**Green**	**B**	**Confirmed**
Jay	*Garrulus glandarius*	**J.**	**Green**	**T**	**Probable**
Magpie	*Pica pica*	**MG**	**Green**	**T**	**Probable**
Moorhen	*Gallinula chloropus*	**MH**	**Green**	**T**	**Confirmed**
Nuthatch	*Sitta europaea*	**NH**	**Green**	**T**	**Probable**
Pied Wagtail	*Motacilla alba*	**PW**	**Green**	**B/T**	**Probable**
Robin	*Erithacus rubecula*	**R.**	**Green**	**T**	**Probable**
Rook	*Corvus frugilegus*	**RO**	**Green**	**T**	**Probable**
Sedge Warbler	*Acrocephalus schoenobaenus*	**SW**	**Green**	**G**	**Confirmed**
Sparrow Hawk	*Accipiter nisus*	**SH**	**Green**	**T**	**Probable**
Swallow	*Hirundo rustica*	**SL**	**Green**	**B**	**Probable**
Tree creeper	*Certhia familiaris*	**TC**	**Green**	**T**	**Probable**

Common Names	Latin Name	BTO Species code	Conservation Status	Breeding & Nesting Habitat†	Breeding Status on Site*
Water Rail	*Rallus aquaticus*	**WA**	**Green**	**W**	**Probable**
Whitethroat	*Silvia communis*	**WH**	**Green**	**T**	**Probable**
Woodlark	*Lullula arborea*	**WL**	**Green**	**T**	**Probable**
Woodpigeon	*Columba palumbus*	**WP**	**Green**	**T**	**Confirmed**
Wren	*Troglodytes troglodytes*	**WR**	**Green**	**T**	**Confirmed**
Ring necked Pheasant	*Phasianus colchicus*	**PH**	**No Status**	**G**	**-**
Little Owl	*Athene noctua*	**LO**	**No Status**	**T**	**-**
† Key G = Ground nesting T = Trees, woodland and/or hedgerow W = Water or next to water B = Buildings					

Table 12.11b: Birds recorded as being present at the Site 2019

Grey wagtail	*Motacilla cinerea*	**GL**	**Red**
Herring gull	*Larus argentatus*	**HG**	**Red**
Linnet	*Carduelis cannabinia*	**LI**	**Red**
Mistle thrush	*Turdus viscivorus*	**M**	**Red**
Oystercatcher	*Haematopus ostralegus*	**OC**	**Amber**
Reed bunting	*Emberiza schoeniclus*	**RB**	**Amber**
Stock dove	*Columba oenas*	**SD**	**Amber**
Swift	*Apus apus*	**SI**	**Amber**
Blue tit	*Cyanistes caeruleus*	**BT**	**Green**
Brambling	*Fringilla montifringilla*	**BL**	**Green**
Feral pigeon	*Columba livia*	**FP**	**Green**
Great tit	*Parus major*	**GT**	**Green**
Lesser whitethroat	*Sylvia curruca*	**LW**	**Green**
Little ringed plover	*Charadrius dubius*	**LP**	**Green**
Long-tailed tit	*Aegithalos caudatus*	**LT**	**Green**
Sand martin	*Riparia riparia*	**SM**	**Green**

Canada goose	*Branta canadensis*	**CG**	No Status

12.136 Red listed species have been subject to rapid breeding declines nationwide. Of the species recorded within the boundary of The Site, four of these breeding species were on the BoCC 'Red list'. These were: **House Sparrow, Song Thrush, Starling** and **Yellowhammer**. These species are of particular conservation concern and are most vulnerable to negative impacts upon their breeding success. All of the red listed species were present in low numbers within the site boundary (see Table 12.12).

12.137 A further seven breeding species appear on the BoCC 'Amber list', these being: **Bullfinch, Common Kestrel, Dunnock, House Martin, Mallard, Tawny Owl** and **Willow Warbler**. Again numbers present were in low abundance in and around The Site indicating The Sites' relatively low importance for these species. The only exception to this were Dunnocks, which were the most numerous species on site.

12.138 All regularly occurring species that do not qualify under any of the red or amber criteria are green listed. The 'Green list' also includes those species listed as recovering from Historical Decline in the last review that have continued to recover or do not qualify under any of the other criteria.

Table 12.12: Peak counts of possible and confirmed breeding birds on the site during surveys 2012 and 2019

Species	Peak count May	Peak count June	Peak count July	Peak count August
House Sparrow	4	3	-	1
Song Thrush	6	4	4	5
Starling	4	2	12	-
Yellowhammer	-	1	1	1
Bullfinch	3	2	1	3
Common Kestrel	1	1	1	1
Dunnock	20	10	7	7
House Martin	-	1	-	-
Mallard	-	1	1	1
Tawny Owl	1	1	1	1
Willow Warbler	2	2	1	1
Grey wagtail	-	1	-	
Herring gull	-	-	8	
Linnet	2	-	1	
Mistle thrush	1	2	1	
Oystercatcher	1	1	7	
Reed bunting	-	2	1	
Stock dove	6	7	7	
Swift	-	1	-	

12.139 The pasture and arable fields provide a valuable foraging habitat for three species of high conservation concern; these being the song thrush, starling and yellowhammer.

12.140 Mature trees form a notable habitat feature of the Site and are found as a component of hedgerows (or as relics of defunct hedgerows) and in the mixed plantation woodland. Several bird species were found to be confirmed or probably breeding in these areas; of which song thrush is of high conservation concern, and willow warbler and dunnock are of medium conservation concern. Mature trees are also important for roosting birds both during and outside the breeding season and as perching areas for foraging predators of which a number were seen at the Site including kestrel, sparrowhawk, buzzard and barn owl. These raptors are not necessarily red or amber listed species, but their presence in low numbers on the site as apex predators is noteworthy.

12.141 There are a number of ponds across the Site and both mallard and moorhen have been observed using these.

12.142 Table 12.13 summarises the conservation status of the birds present at the Site, and whether they are listed as probable or confirmed breeders.

Table 12.13: Summary of Conservation and breeding status of birds present at The Site

Status	Species	Breeding on Site	
		Probable	Confirmed
Annex I EU Birds Directive	None present		
Schedule 1.1, 1981 Wildlife & Countryside Act	Barn owl (foraging presence only)		
Section 41, 2006 Natural Environment & Rural Communities Act. Species of Principal Importance.	Bullfinch, dunnock, grasshopper warbler (flying through), house sparrow, lapwing (non-breeder), marsh tit (non-breeder), song thrush, starling, yellowhammer	Bullfinch House sparrow Song thrush Starling	Yellowhammer Dunnock
BTO/RSPB Red List	Grasshopper warbler (flying through), house sparrow, lapwing (non-breeder), marsh tit (non-breeder), song thrush, starling, yellowhammer	House sparrow Song thrush Starling	Yellowhammer

Status	Species	Breeding on Site	
		Probable	Confirmed
	Grey wagtail Herring gull Linnet Mistle thrush		
BTO/RSPB Amber List	black headed gull (non-breeder), bullfinch, common kestrel, dunnock, house martin, lesser black-backed gull (non-breeder), mallard, snipe (non-breeder), tawny owl, willow warbler, meadow pipit, Oystercatcher, Reed bunting, Stock dove, Swift	Bullfinch Common kestrel House martin Mallard	Dunnock Tawny owl Willow warbler

12.143 Valuation: the Site supported a range of species typical of mixed farmland and the built environment, and none were present in large numbers or were unusual encounters for the County or locality. Five red listed and seven amber listed breeding birds were either confirmed or probable breeders at the Site, which is a low result for such a large Site, and therefore the Site is not considered to be of high importance for breeding birds of conservation concern. When assessed against the Lancashire Revised Guidelines for the Selection of Biological Heritage Sites: Birds (2006)[xxi], the assemblage of breeding birds does not qualify against the selection criteria and misses these criteria by a wide margin and the Site is therefore judged to be of considerably less than County importance. Overall, it is considered that the assemblage of surrounding habitats and the bird list for The Site places it at the Borough level for overall importance.

Reptiles

12.144 The Site was assessed for its reptile suitability. In particular the potential for the presence of slow worm (Anguis fragilis) was considered. Other Lancashire species such as common lizard, adder and grass snake were scoped as being very low likelihood of presence due to the Site's isolated location from optimal habitat, poor suitability of the pasture habitat on the Site and the lack of previous desk study records. Inspection confirmed that the Site had poor suitability for reptiles. Note was made of the lack of varied vegetation structure (fields either uniformly grazed or dense rush habitat) and the exceedingly limited extent of any suitable vegetation types, structure and extent. In addition, the topography of the Site was flat and this also meant that aspect was poor for reptiles, and connectivity to other suitable habitat was exceedingly poor.

12.145 Ecologists on Site during the Spring and Summer of 2012, 2016 and spring 2022, when the other ecological surveys were conducted at the Site, were vigilant for any incidental records of reptiles, but none were found. On the basis of this assessment, it was concluded that there was no reasonable likelihood that reptiles would be present at the Site. No further intensive reptile survey was undertaken.

12.146 Valuation: Grass snake, common lizard, adder and slow worm are Priority Species in the UK Biodiversity Action Plan and protected from killing and injuring under Schedule 5 (Section 9) and of the Wildlife and Countryside Act 1981 (as amended). Taking into account the absence of reptiles from the survey area, no further evaluation in relation to potential impacts upon these species was considered relevant or necessary.

Otter and Water vole

12.147 On inspection the Site was considered sub-optimal for otter. No signs of otter use such as spraints, feeding remains or couches were noted during surveys of the Site and no further detailed survey for otter was undertaken.

12.148 The un-named watercourse which runs through The Site was considered potentially suitable for water vole, with good cover of aquatic plants and reasonable depth of water through much of the year. Comprehensive field survey for water vole failed to identify any evidence of the species within the Site. Field vole (Microtus agrestis) burrows, feeding signs and latrines were abundant within 3m alongside the stream banks.

12.149 Valuation: Otters and water voles receive legal protection under the Wildlife and Countryside Act 1981 (as amended) and otters are also protected under Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. These species are considered to be of conservation concern, and are UK BAP Priority Species. Taking into account the absence of otters and water voles from the survey area, no further evaluation in relation to potential impacts upon this species was considered relevant or necessary.

Badger

12.150 The pasture habitat with woodland cover was considered good habitat for badgers, but no evidence of activity was found within 50m of The Site during the several months of ecological surveys across the Site. It is likely that the fairly isolated nature of the land (cut off from adjoining countryside by the M6, M65 and Bamber Bridge and Leyland), plays a part in the lack of badger presence.

12.151 Valuation: Badgers receive legal protection under the Wildlife and Countryside Act 1981 (as amended) and The Protection of Badgers Act 1992. Taking into account the absence of badgers from the survey area, no further evaluation in relation to potential impacts upon this species was considered relevant or necessary.

Site Evaluation

Designated sites

12.152 There are no designated nature conservation sites within the Site. All designated sites situated within 2km of the application site are listed in Tables 12.4 and 12.5. The level of designation provides the assessed level of ecological value within their geographical frame of reference.

12.153 There are two designated sites within 2km of the Site which are within the zone of influence for potential impacts due to the Development. These are Cuerden Valley Park and River Lostock, which is a designated Biological Heritage Site (BHS) and Preston Junction Local Nature Reserve (LNR).

12.154 Cuerden Valley Park and River Lostock BHS lies approximately 500m to the north and west of The Site at its closest point and is separated from The Site by the M6 motorway. Preston Junction LNR lies 600m to the north of The Site.

Habitats

12.155 The habitats present on the Site and their assessed level of ecological value in a geographical context is shown in Table 12.14.

Table 12.14: Summary of Habitats within the Site (descending order of value)

Feature	Level of importance	Assigned Value
Hedgerow (Priority habitat)	Falls within the broad native hedgerow Priority Habitat type. Some sections are high quality and meet the Important Hedgerow definition under the Hedgerow Regulations (14% of the resource on Site by length). Part of the LBAP 'Arable Farmland' habitat description.	Borough
Ponds (Priority habitat)	Ponds used by Common Toad a UK BAP species Pond Scores do not meet the threshold (≥1.5) for qualification under the Lancashire BHS Guidelines and therefore the habitat is considered to be of less than County importance.	Borough
Running Water	LBAP habitat. Good habitat quality. Optimal habitat for water voles but none were recorded and no signs were noted. Of value for other aquatic species.	Site
Marshy grassland	Semi-improved in nature, having undergone agricultural improvement, often dominated by rushes. Does not approach species-rich fen or mire vegetation types. No ground nesting birds were recorded.	Site

Feature	Level of importance	Assigned Value
Marshy grassland within Lancashire Grassland Network	Semi-improved in nature, having undergone agricultural improvement, often dominated by rushes. Does not approach species-rich fen or mire vegetation types. No ground nesting birds were recorded but within Lancashire Grassland Network 3km Corridor.	Borough
Ruderal	Vegetation structure and foraging for invertebrates	Site
Scattered Trees	Potential value for wildlife particularly bats and nesting birds	Site
Scrub	Limited in area. Habitat for invertebrates, birds and small mammals.	Site
Species-poor semi-improved grassland	Species-poor with low floristic diversity and significantly affected by agricultural improvement. Not considered of good ecological quality when assessed against the Lowland Meadow BAP habitat definition. Clearly not ancient or old semi-natural grassland and does not qualify under the Lancashire BHS Guidelines.	Site
Species-poor semi-improved grassland within Lancashire Grassland Network	Species-poor with low floristic diversity and significantly affected by agricultural improvement. Not considered of good ecological quality when assessed against the Lowland Meadow BAP habitat definition. Clearly not ancient or old semi-natural grassland and does not qualify under the Lancashire BHS Guideline but within Lancashire Grassland Network 3km Corridor.	Borough
Improved grassland	Very species-poor with very limited ecological value. Not used by ground nesting birds at this Site.	Site
Bare ground	Negligible value	Site

Species

12.156 The species afforded highest conservation status that are found within the Site are Common Toad, bats and breeding birds (Table 12.15).

12.157 Present within the Site, Common Toad are a UK BAP Species. Suitable terrestrial habitat exists within the Site and therefore it is clear that habitat for the species has potential to be adversely impacted by the development.

12.158 There are no bat roosts present within the Site, however there is some value for foraging and commuting. Maintenance of coherent bat flight lines, most notably along Stoney Lane, will be required as surveys indicated that bats use Site features for commuting between likely roosts and foraging areas outside the Site.

12.159 The populations of bats, a Natura 2000 Protected Species[1], are assessed to be of no more than Borough importance. Qualitatively and quantitatively the populations on the Site do not merit County significance.

12.160 Because of its size rather than range of suitable habitats, the Site supports a moderately diverse assemblage of farmland breeding bird species, including two confirmed species on the 'red list' of birds of conservation concern. There were no breeding birds recorded listed in Schedule 1 of the Wildlife and Countryside Act (as amended). Although Red List birds are present, the valuation of importance takes into account population size and regional status of these species. Due to supporting a low population of five bird species undergoing national population decline (BoCC Red List), in combination with the act that the Site does not meet BHS guidelines, The Site is considered to have borough importance for these species. The common and widespread breeding bird assemblage is of Site level importance.

12.161 There was a lack of survey evidence for badger, reptiles, otter, water vole and brown hare, so the Site is assessed to be of negligible importance for these species.

12.162 The Site is not considered to be of significance for any other rare, priority or protected species.

[1] Natura 2000 is a network of protected areas covering Europe's most valuable and threatened species and habitats.

Table 12.15: Summary of Species within the Site

Feature	Characteristics of feature	Reason for importance	Assigned Value
Bats	No roosts within Site. Commuting and foraging only within Site	Small population of protected species. Natura 2000 Protected Species, s41 NERC Act species and LBAP species.	Borough
Amphibians	Common toad	NERC species of principle importance and UK BAP Species.	Borough
	Smooth newt	Low population	Site
	Common frog	Low population	Site
Breeding Birds	house sparrow, song thrush, starling and yellowhammer	4 confirmed breeding Red List species of conservation concern (BoCC). These species are not present in the numbers required to qualify under the Lancashire BHS guidelines, and The Site is therefore considered to be of less than County importance.	Borough

Feature	Characteristics of feature	Reason for importance	Assigned Value
	Common and unthreatened breeding bird assemblage	Widespread species typical of farmland and urban fringe. The breeding bird assemblage does not qualify under the Lancashire BHS guidelines and is therefore considered to be of less than County importance	Site

Important Ecological Features

12.163 Important ecological features have been defined according to CIEEM (2016). They are those features which are both important and potentially impacted by the development (see Table 12.16). Significant impacts are those which affect biodiversity conservation objectives, and these have been defined for the Site according to national, regional and local conservation priorities for habitats and species, defined by the UK BAP, NERC habitats and species of principle importance, Lancashire BAP and Lancashire BHS selection criteria.

Table 12.16: Summary of Important Ecological features

Important Ecological Feature		Selection Criteria
Habitats	Hedgerow (priority habitat)	Habitat of principle importance Important Hedgerow as defined by The Hedgerow Regulations Negatively impacted by the Development (habitat loss/ damage).
	Ponds (priority habitat)	Ponds supporting Common Toad Total loss of habitat
	Grassland	Grassland within Lancashire Grassland Network. Partial loss and damage

Important Ecological Feature		Selection Criteria
Species	Common Toad	s41 NERC Act species. Species of principle importance. UK BAP species. Total loss of breeding habitat
	Bats	Natura 2000 protected Species, s41 NERC Act species and LBAP species. Loss of linear features and foraging habitat. Artificial lighting impacts.
	Breeding Birds	Red and Amber BoCC and s41 NERC Act species. Species of principle importance. Loss of foraging and nesting habitat

Zone of Influence

12.164 The zone of influence of the Development has been assessed against each ecological feature that has potential to be affected (see Table 12.17).

Table 12.17: Ecological Features in relation to their Zone of Influence

Important Ecological Features		Zone of Influence for potential impacts to feature
Habitats	Hedgerow (priority habitat)	Site - loss of habitat. Site and adjacent to Site - Potential for dust effects on vegetation dependent upon wind and ground moisture conditions.
	Ponds (priority habitat)	Site - loss of habitat.
Species	Common Toad	Site - direct killing/injury and habitat loss.
	Breeding birds	Site - direct killing/injury and habitat loss.
	Bats	Site - potential disruption to flight paths and loss of foraging habitat.

		The local geographical range of territories used by mating and foraging species that use The Site. Site and land immediately adjacent to Site - Artificial lighting effects.
Wider biodiversity		**Zone of Influence for potential impacts to feature**
Habitats	Species-poor semi-improved grassland, marshy grassland, deciduous woodland, scrub, scattered trees, ruderal	Site - loss of habitat. Site and adjacent to Site - Potential for dust effects on vegetation dependent upon wind and ground moisture conditions. Pollution/siltation effects on running water.
Species	Amphibians – smooth newt & common frog	Site - direct killing/injury and habitat loss.
Designated Sites	Preston Junction LNR Cuerden Valley Park & River Lostock BHS	Not within the ZOI of potential impacts generated by the Development

Social or economic value

12.165 There is a public bridleway which follows part of Stoney Lane, from Stoney Lane house eastwards to an intersection with a north-south public footpath. The footpath crosses The Site from the M65 to Bottoms Farm on Lydiate Lane. There is also a section of public footpath that trends westwards from the vicinity of Bottoms Farm to Wigan Road where this underpasses the M6. The Site therefore has some social value relating to public access.

12.166 The Site is currently used for agricultural production, therefore the Site has current intrinsic economic value.

Likely Significant Effects

Requirements of the Scoping Report

12.167 Construction phase:

- Land-take (habitat loss)
- Disturbance (noise and lighting)
- Hydrology and air quality (aquatic and dust pollution)
- Construction site hazards (direct killing or injury).

12.168 It has been identified that the above four impacts need to be discussed in relation to the following important ecological receptors:

1. Hedgerow (Priority habitat);
2. Ponds (Priority habitat);
3. Common Toad;
4. Bats;
5. Breeding birds.

12.169 Operational phase:

- Disturbance
- Hydrology and air quality (waterbodies and dust)

12.170 These operational impacts as discussed in relation to the following important ecological receptors:

1. Nature conservation sites (Visitor pressure disturbance and trampling)
2. Bats (lighting and predation)
3. Common Toad (disturbance and predation);
4. Hedgerow and Ponds;
5. Wider biodiversity;

12.171 This section is extensive, and therefore a clear idea of its structure will be helpful for the reader. Throughout a consistent format has been adopted which flags each issue and addresses all the possible pathways to impact in turn. This provides a repeatable format which can be compared for each ecological feature (be they species or habitats). So that the reader can keep track within the document, a signposting diagram has been used at the start of each new topic which will provide a useful reference.

- **Embedded Mitigation**: the chapter discusses embedded mitigation measures as these will ameliorate any of the impacts which can readily and easily be addressed in the scheme.
- **Construction Impacts**: the chapter then considers the construction phase impacts upon the important ecological features and general biodiversity.
- **Operational Impacts**: The operational phase impacts upon important ecological features and general biodiversity.
- **Cumulative Impacts**: Finally the chapter address the cumulative impacts from other nearby projects.

12.172 Consideration is given to those ecological features that may be affected by any of the potential effects identified in the scoping exercise. Where ecological features have no potential to be affected those features are not included in the discussion.

Embedded Mitigation

12.173 During the design process for the Site, embedded mitigation and compensation measures have been factored into the design. Taking these measures into account, the following assessment of potential impacts are based on the assumption that these embedded mitigation measures will be complied with during the construction and operational phases of the Development.

Direct killing or injury of protected species

12.174 Without appropriate mitigation measures in place vegetation stripping and vehicular movements could result in uncontrolled injury or killing of protected species within the Site. It is known from the 2012, 2019 and 2022 surveys that there is a risk of breeding birds and common toads being present. Therefore to ensure legislative compliance the construction method must not cause reckless or intentional killing or injury of these species groups. In order to ensure no offences are committed the construction works must ensure the avoidance of habitat loss during the bird nesting season. Common Toad have no direct protection from killing or injury but should not be subject to deliberate or unnecessary suffering. These measures will be described within the CEMP and will ensure legislative compliance and will be secured through conditions to the planning consent.

Direct loss of habitat (land-take)

12.175 Construction would result in a direct loss of habitat that would be a significant adverse impact at the local level. Without appropriate measures in place vehicular movements could also result in uncontrolled destruction or loss of habitat in areas of the Site due for retention and also areas outside of the Site. Mitigation measures have been embedded into the Development during the construction phase in order to reduce potential impacts from unnecessary direct loss of habitat. These should be detailed in the CEMP and include:

- Clear mapping of the Site boundaries to ensure all contractors are aware of the Site footprint;
- Provision of site induction/toolbox talk to all site staff and sub-contractors to ensure they are aware of the Site boundaries;
- Ensuring that only fully inducted staff are permitted to operate machinery used on the Site;
- Keeping land-take to the minimum possible necessary to enable the access/egress of tracked machinery and Site development operations;
- Provision of temporary fencing/highly visible markers in sensitive areas and retained areas, to assist in delineation of the Site boundary in areas where it might be unclear/uncertain;
- Provision of a clearly marked vehicle compound for storage of all machinery overnight;
- Prevention of vehicle parking overnight in any areas outside the Site boundary;

- Provision of clear advice must be made available to contractors working on the Site in relation to vehicle re-fuelling to ensure spillage does not result in damage to or loss of habitat;
- Control of tipping/dumping/bunding (or any other temporary storage) of stripped soils and/or construction materials in strictly delineated areas.

12.176 Any surplus excavated material will be used within the Development including the unsuitable material which will be used for landscape fill and habitat creation. This will ensure that there is no need for land-spreading which would result in further significant habitat disturbance or loss at the local level through the wider landholding.

Disturbance, noise, ground vibration and increased human activity

12.177 Operations during the construction phase have the potential to generate noise to levels above existing background levels. Primarily, this is expected to arise through vehicular movements and use of construction equipment which will occur during daylight hours only. For example, excessive noise has the potential to disturb or displace taxa such as breeding birds in proximity to the Site.

12.178 Mitigation measures have been embedded into the Development for the construction phase in order to reduce potential impacts from noise pollution. These measures will form part of a CEMP to be secured by condition and include:

- Ensuring that all equipment used on the Site is maintained in good operating condition with all noise suppressing measures in place;
- Checking that all vehicles and plant brought onto the Site on a contract basis are suitably noise suppressed;
- Ensuring that working practices are put in place that minimise noise generation; these would include the timing/positioning of noise sources away from any sensitive ecological receptors in conjunction with the reduction of vehicle speeds;
- Ensuring that vehicles and plant operating on site are fitted with low-noise reversing alarms such as directional or automatically variable alarms;

- Ensuring that site staff have appropriate sited rest and welfare facilities, the location of which minimises noise and disturbance of habitats and species within the Site.

Dust and Air Quality

12.179 The construction phase has the potential to give rise to dust emissions if not appropriately managed. The risks are related to four main activities:

- Earthworks
- Construction
- Trackout

12.180 Following Institute of Air Quality Management (IAQM) guidancexxii, risk is assessed for each of the above activities. IAQM guidance places habitats and species into a hierarchy of 'high', 'medium' and 'low' sensitivity in relation to fugitive dust. The Site and anticipated ZOI for fugitive dust, contain no designated sites, habitats, vegetation types or species which are particularly sensitive to dust, and so these are judged to be 'low' sensitivity receptors. However, airborne particulate matter has the potential to alter soil and water chemistry and poor environmental controls should be avoided. At its most extreme negative effects could arise from direct smothering of plants at high fugitive dust loadings during construction.

12.181 Potential sources of dust would be the construction sites, and the passage of vehicles into and around the Site which can result in fugitive dust if not maintained free of mud and debris. Fugitive dust is more likely to arise in dry, windy conditions.

12.182 Good dust mitigation measures will need to be in place for all stages of the Development. The implementation of a Dust Management Plan which details good housekeeping practices during demolition and construction as well as their recording and monitoring will be essential. Such practices might best be delivered through a CEMP to prevent significant dust pollution issues from arising. The emphasis will be on anticipating potential dust hazards rather than waiting for them to arise before taking action.

12.183 As long as the above measures are implemented the generation of fugitive dust beyond the confines of the Site is considered within the Air Quality Chapter to be negligible as it was scoped out.

Pollution Prevention: Un-named stream and groundwater

12.184 A small un-named stream bisects the northern part of the Site, and there are a couple of seasonally wet ditches which run into and alongside Stoney Lane. There are no other watercourses on the Site. The nearest river is the River Lostock, the upper reaches of which are 70m away and flow past the northern edge of the Site. The Lostock lies on the far side of the A582 dual carriageway and the small stream and ditches on the site flow into the Lostock.

12.185 Construction activities such as vegetation clearance, soil stripping and vehicular movements can lead to pollution of waterbodies through hazardous substances. Potential pollutants include surface run-off siltation, diesel, oil and other chemicals or solvent spillage. The washing of vehicle wheels also has the potential to pollute nearby waterbodies. Siltation can lead to direct smothering of aquatic life with a potentially negative ecological impact as a result.

12.186 The potential ZOI for adverse pollution impacts extends beyond the Site downstream. The ZOI would vary according to the nature of the pollutant, particulates would cause localised impacts, whereas chemical pollutants may have effects on the River Lostock and beyond, albeit attenuated by increasing dilution with progression through the river system from the Lostock through to the River Ribble and the Ribble Estuary.

12.187 In terms of groundwater resources, the Site is located upon Glacial Till Deposits and mudstone which are known to have low permeability. It is predicted that these deposits will not be susceptible to any potential contaminants as they will act to prevent pollution of the underlying bedrock aquifer. Also, any contaminants which enter the near the surface groundwater will also have low mobility and therefore risk of entering the nearby River Lostock. It is clear, therefore, that the Site is inherently quite robust against the spread of any potential contaminants to any other off-site water resources.

12.188 Taking the above geological factors into account, water quality protection measures during Construction and Operation should be readily implementable at the Site.

12.189 The incorporation of standard construction and operational good practice measures such as attenuation basins and Sustainable Urban Drainage Systems at the Site have identified that these discharges should be adequately controlled.

12.190 In order to effectively control and minimise the risk of increased surface water run-off, siltation and pollution, measures included in the CEMP working method statements prepared for this project must be followed. A list of suitable control measures to be included in the CEMP are as follows:

- The Site is not a controlled environment in terms of surface water runoff. The installation of adequate new drainage before the Site is built out will ensure that any runoff will be minimised;
- Clear pollution prevention control measures will be drawn up and implemented throughout the duration of the construction and operational period;
- Appropriate silt traps and sediment control measures will be installed where appropriate. This will ensure that run-off does not introduce inappropriate sediment release into the stream;
- Effluent and foul water discharge control is required during operations. Foul water used for welfare facilities will be contained and taken away from the Site for disposal;
- The amount of exposed ground and short term soil stockpiles from which water may drain will be minimised and will be placed as close as possible to the final location where they will be used. This will minimise any double handling;
- Construction methodologies should ensure that vegetation will only be cleared from areas that need to be exposed and surfaced immediately in line with phased development plans;
- Vehicle washing or shake down area(s) should be located at a suitable designated area of hard standing which will be at least 10 metres from any waterbody;
- Any concrete and cement mixing and washing areas will be sited 10 metres from any waterbody to minimise the risk of run-off entering these;
- Any fuel, oil and chemical storage on site will be stored in a safe and secure way on an impervious base within a secondary containment system such as a bund. The base and bund walls will be impermeable to the material stored and able to contain at least 110% of the volume stored. The storage area will be sited at least 10 metres from any waterbody and clearly marked on The Site plan;
- Spill kit with sand, earth or commercial products that are approved for the stored materials will be kept close to the storage area(s). Staff will be trained on how to use these correctly;
- Any damaged leaking or empty drums will be removed from site immediately and disposed of appropriately;

- The risk of spilling fuel is at its greatest during refuelling of plant. To minimise this risk, mobile plant will be refuelled in a designated area on an impermeable base at least 10m away from drains and the waterbodies. All refuelling will be supervised. Drip trays will be positioned under pumps to catch minor spills and a spill kit with sand, earth or commercial products for containment of spillages will be kept nearby.

Construction Impacts

12.191 Construction impacts identified at scoping stage are:

- Land-take (habitat loss);
- Disturbance (visual , noise and lighting);
- Hydrology and air quality (dust and aquatic pollution);
- Construction site hazards (direct killing/injury).

Construction Impacts on Important Ecological Features

12.192 The scoping exercise, surveys and assessment undertaken at the Site revealed that six potentially important ecological features exist on the Site. Important Ecological Features are those which are both ecologically important (as defined by national, regional and Lancashire biodiversity conservation objectives) and potentially negatively affected by the Development. These were identified as:

- Hedgerow (priority habitat)
- Ponds (priority habitat)
- Grassland
- Common Toad
- Bats
- Breeding Birds

Land-take (Habitat loss)

12.193 Habitat loss due to land-take is defined as the loss of habitat during construction.

Hedgerow

Hedgerow: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.194 Development of the Site (land take, habitat destruction and construction) will result in the loss of a large percentage of existing hedgerow, although the majority of peripheral hedgerows will be retained. The impact is notable and significant as this is a NERC S41 habitat.

Characterisation of impact on the feature

12.195 The existing hedgerow resource totals 400m of species-rich hedgerow and 4087m of species-poor hedgerow (6092m in total).

12.196 280m of the species-rich hedgerow is being lost and there will be a temporary or permanent loss of this ecologically important habitat. 1037 linear metres of species-poor hedgerow is being lost during the construction phase.

12.197 Hedgerow loss represents an impact upon 21% of existing resource of this priority habitat type. Therefore, although a fairly high level of loss will arise, the majority of hedgerows will be retained.

Rationale for prediction of effect on integrity or conservation status

12.198 Due to the loss of this habitat type across The Site there is the potential for a loss of nesting and foraging habitat for species groups such as birds, bats, terrestrial mammals and invertebrates. Removing these features from the landscape reduces the connectivity and wildlife corridor value for these species, and there will be a loss of ecosystem functionality at the borough level in respect of habitat severance.

Significance of impact

12.199 It is anticipated that, in the absence of mitigation, the construction phase of the Development will result in a significant but potentially reversible long term negative impact upon species rich and species-poor priority hedgerow habitat. This would be significant at the Borough level.

Priority Pond Habitat

Pond priority habitat: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.200 Development of the Site during construction will result in the loss of all 3 priority habitat ponds. This is 100% of the priority habitat type. In addition there will be large-scale disturbance and loss of surrounding terrestrial habitat which lies near to these ponds.

Characterisation of impact on the feature

12.201 The Site clearance activity will result in pond drainage and in-filling. The overall impact can be characterised as a 100% loss of functional priority pond habitat at the Site.

Rationale for prediction of effect on integrity or conservation status

12.202 Priority pond habitat at the Site will be adversely impacted during the construction phase. It is worth stating that the priority pond definition at the Site has arisen because there is a criterion for priority ponds status based solely upon the presence of a UK BAP species (Common Toad). Taken in the round, the ecological value of the ponds on Site is relatively low, as shown by the Lancashire Pond Survey results which displayed a low diversity of flowering plants and invertebrates. Nevertheless, three ponds are considered as meeting the priority habitat type, and it is clear that a negative impact will arise.

Significance of impact

12.203 It is anticipated that, in the absence of mitigation, construction activities will result in the total loss of priority pond habitat. This will be significant at the Borough level.

Grassland

Grassland: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.204 Development of the Site during construction will result in the loss of a significant area of grassland which is within the Lancashire Grassland Network.

Characterisation of impact on the feature

12.205 The Site clearance activity will result in grassland loss. The overall impact can be characterised as a 100% loss of functional grassland within the Lancashire Grassland Network at Site level.

Rationale for prediction of effect on integrity or conservation status

12.206 Grassland on the Site is in itself not ecologically valuable but is part of a wider grassland network.

Significance of impact

12.207 It is anticipated that, in the absence of mitigation, construction activities will result in the total loss of grassland habitat within the Lancashire Grassland Network. This will be significant at the Borough level.

Common Toad

Common Toad: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.208 Development of the Site will result in the disturbance to and loss of aquatic and terrestrial habitats which are used by Common Toad.

Characterisation of impact on the feature

12.209 The Site clearance activity has clear potential to negatively affect Common Toad populations by reducing the likelihood of foraging and breeding success. The overall impact can be characterised as a 100% loss of functional Common Toad habitat at the Site.

Rationale for prediction of effect on integrity or conservation status

12.210 The Site has been shown to support only a low population of Common Toad. The viability of such a small population is questionable and therefore any negative impact is likely to have a significant impact on the conservation status of Common Toad at the Site. Without mitigation there is a negative impact on Common Toad breeding potential due to total loss of standing water habitat.

12.211 Common Toad populations occur in the wider area. But fragmentation would occur East/ West across the site due to the M65 to the North and a sand quarry to the South. Retention of the tree line along Stoney Lane would still provide some connectivity.

Significance of impact

12.212 It is anticipated that, in the absence of mitigation, the construction phase will result in a significant negative impact on Common Toad at the Borough level.

Bats

Bats: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.213 Development of the site will result in the loss of scattered mature trees within the site. However, surveys have demonstrated that no bat roosts are present on the Site, although the trees did have some potential roost features (PRFs). In addition night-time transects showed that there was limited bat flight activity within the Site boundaries. The main area where bat activity was detected was along the hedge and tree lines along Stoney Lane and School Lane, which will be retained. Habitat loss at the Site during the construction phase will result in the loss of the internal features used by bats, which were the hedgerow, trees and ponds.

12.214 There will be some retention of existing trees and hedgerow, but the loss of all woodland, some tree lined hedgerow and ponds are the habitats that will be impacted which are of particular value to bats within the landscape.

Characterisation of impact on the feature

12.215 Bat activity surveys showed that the main features used by foraging bats were Stoney Lane, Old School Lane and hedgerow ZL adjacent to Pond 17 in the south of the Site. All other areas showed low use or no use by foraging bats as Site suitability is generally low.

12.216 Bats commuting along features (either overflying or exiting from foraging areas) were seen to use the following features: the eastern section of Stoney Lane with good tree cover was used by bats exiting to a roost east of the Site; Old School Lane was used by bats exiting to a roost north of The Site; noctules were recorded overflying fields in the centre of The Site in a west to east south direction above Stoney Lane; common pipistrelles were recorded exiting foraging area around Pond 17 to a roost west of the Site using hedges in this area.

12.217 The Development will see the retention of Old School Lane and Stoney Lane, the two areas of greatest bat activity on the site. However, the habitat at Pond 17 will be lost, as will other hedgerows on the Site. There will be a potentially reversible loss of hedgerow and tree lines and therefore there will be severance and reduction in value of this foraging and commuting habitat for bats. Bats were also seen to forage in low numbers along the mixed plantation woodland edge and around the other ponds, so the loss of these preferred habitats will remove habitat and food sources which provided bats with resources within the site. The long times scales involved in establishing mature hedgerow and trees through planting is likely to lead to a medium to long term temporary loss of foraging areas and flight lines that bats currently utilise.

Rationale for prediction of effect on integrity or conservation status

12.218 No loss of active bat roosts will arise as a result of quarry extension plans as surveys found none were present. However, the loss of mature oak trees may cause a loss of bat roosting potential as some of these were judged to have some roosting suitability.

12.219 The impact of losses of valuable bat foraging habitat at the Site are evidenced from interpretation of the transect activity surveys. These characterised that the important habitats subject to temporary losses at the Site, such as trees and hedgerow, will suffer losses during the construction phase. The overall low levels of bat activity were predominantly by common pipistrelle (which is the UK's most widespread species) within the Site and the limited numbers of bats present suggests that any impacts through loss of foraging opportunities will only occur at the local level.

Significance of impact

12.220 Taking the overall context of bat activity at the Site into account, there will not be any impact upon roosting bats, however the long timescale of temporary losses of suitable bat habitat at the Site suggest that bat foraging and commuting is likely to be impacted by loss of suitable habitat during construction. The loss of habitat will result in an impact that potentially reversible in the medium to long-term which is judged to be significant at the Borough level.

Breeding birds

Habitat loss: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.221 The Development will result in loss of 100% of ponds and woodland, the majority of open pasture, hedgerow, and a large number of mature scattered trees. These habitats are essential for bird foraging and nesting. There were no ground nesting birds recorded at the Site, however the temporary loss of trees and hedgerow will have an impact on breeding bird habitat availability.

Characterisation of impact on the feature

12.222 The above activity has clear potential to negatively affect breeding success at the Site. In circumstances where nesting habitat is a limiting factor, a net loss has the potential to further increase competition for nest sites and reduce the productivity of local populations. If alternative nesting habitat was not available, this could lead to a permanent reduction in productivity of some species, either through a reduction in nesting attempts, or perhaps a decrease in survival rates should birds be displaced to sub-optimal habitat.

12.223 Most of the species recorded on the Site are common and widespread lowland breeding birds present in agricultural habitats with hedge and tree cover. However there were five species recorded which are considered to be of conservation concern at a national level (RSPB Red List) namely song thrush (6 pairs), yellowhammer (1 pair), house sparrow (4 pairs) and starling (12 pairs) which will be impacted through either nesting or foraging habitat loss/disturbance.

Rationale for prediction of effect on integrity or conservation status

12.224 The Site has been shown to support low populations of breeding birds, and reduction in breeding habitat availability has potential to have a negative impact upon the local population at the Site. It is considered certain that construction will incur a potentially reversible negative impact (net loss) on the amount of foraging and nesting habitat across the Site for tree and hedge nesting species. It is predicted that the numbers of pairs of birds likely to be displaced through habitat loss during the construction phase would be insignificant in relation to the UK population size and are unlikely to even be significant at the local level. Nonetheless, there will be some adverse effects arising from the construction activities, so compensation measures will need to be detailed to offset the loss of nesting and foraging opportunity.

Significance of impact

12.225 It is anticipated that, in the absence of mitigation, the construction phase of the Development could result in a significant negative impact on breeding birds through negative effects on breeding success due to loss of habitat. The impact of this habitat loss is potentially reversible, if addressed through new habitat creation. The impact is therefore significant at the site level.

Disturbance (Visual, Noise & Lighting)

Important Habitats

12.226 No disturbance impacts such as noise, vibration or light pollution are known to have any adverse effects upon habitats, so these have been scoped out from needing any further assessment.

Bats

Disturbance: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.227 There is the potential that bats could be impacted by construction activities resulting in disturbance. As no roosts were identified at the Site, the likelihood of any disturbance arising from impacts such as noise or vibration have been scoped out. However, there remains one other potential source of disturbance during construction, and this is from temporary night-time site compound security lighting. There is the potential for this to impact upon bat foraging along retained habitat features. It is not reasonably expected that there will be any night time working or associated illumination during the construction phase as these will be ruled out by way of a planning condition.

Characterisation of impact on the feature

12.228 Bats are only likely to be disturbed during foraging if poorly sited security lighting is installed which illuminates retained habitat, such as the Stoney Lane or School lane hedgerows should be avoided, and this should be implemented via a CEMP.

Rationale for prediction of effect on integrity or conservation status

12.229 Night time illumination of the Site for security purposes during the construction phase should be designed to illuminate for the minimal period possible over-night. There could be an adverse impact upon bats unless illumination is small-scale and is designed as directional downlights. This will avoid light spill onto known bat flight lines and foraging areas.

Significance of impact

12.230 In the absence of mitigation, construction phase temporary lighting impacts upon bats are considered to be negligible.

Common Toad

12.231 The construction activities on the Site will remove all breeding habitat and the majority of terrestrial habitat, so in the absence of mitigation, no Common Toad population would be present to be exposed to any disturbance risks during the operational phase. This has been scoped out of any further assessment.

Birds

Disturbance: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.232 There may be a short term negative impact on breeding birds for the duration of the construction phase due to noise disturbance. However, due to the relativity high levels of ambient noise locally, particularly from the existing road network, noise is anticipated to be of low significance and will be effectively controlled through mitigation strategies detailed in a CEMP.

Characterisation of impact on the feature

12.233 Construction operations have the potential to disturb birds using the Site for roosting, foraging, and breeding. Operations which will disturb breeding birds include noise from vegetation clearance, initial ground works and some construction activities such as piling, which are of low frequency but of high amplitude. Active, high level, infrequent disturbance causes most birds to be displaced for short periods xxiii. During the breeding season disturbance may lead to nest desertion or the avoidance of the area and reduce the suitability of retained nesting areas such as the hedgerows and nearby trees. Whilst there is some potential for breeding success to be reduced, this is not expected to affect the local conservation status of the bird species using the Site for breeding. Construction disturbance effects on birds are therefore expected to be short-term and temporary, but in the absence of mitigation proposals, could have an adverse effect upon the assemblage at a local level.

Rationale for prediction of effect on integrity or conservation status

12.234 Birds within the Site are already exposed to high levels of anthropogenic disturbance such as noise, vibration and light. During construction there will be a significant increase in levels of human and machinery activity throughout the Site. This is a large and multiple phase development. In the case of large scale developments in which the construction phase may last several years, there is the opportunity for wildlife will habituate to the conditions.

12.235 Therefore, significant disturbance impacts upon any remaining nesting bird population in the retained habitats are not considered likely due to their likely habituation. However, if construction activities take place in very close proximity to nest sites birds in nearby retained habitats, then small-scale nest abandonment may arise.

12.236 In all, some temporary disturbance impacts cannot be ruled out which might affect relatively small numbers of the bird species at the Site but significant impacts, such as those which might arise if ground nesting species or Schedule 1 species were present, are not predicted to occur.

Significance of impact

12.237 Overall, it is anticipated that the majority of nesting pairs will remain on nests throughout the construction period as urban fringe species are resilient to human activities and disturbance and there is no evidence to suggest that wholescale nest desertion will arise. The birds are likely to become habituated to low intensity disturbance effects, such as an increase in human presence and associated ambient noise. Disturbance is considered negligible.

Hydrology and Air Quality (Aquatic and Dust)

Hedgerows

Disturbance: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.238 There is potential for impacts upon hedgerow vegetation from fugitive dust particularly in relation to smothering effects and chemical (pH) effects for cement dust.

Rationale for prediction of effect on integrity or conservation status

12.239 The type of soils and works involved in the construction of this mixed use Development are crucial determinants as to whether the is an adverse effect upon air quality arising from the Development. The Air Quality Chapter of this ES (Chapter 11) does not identify any particular issues with dust emissions for the Site that are out of the ordinary for a development of this scale. As long as standard dust suppression methods are implemented then no significant dust deposition issues will arise.

Characterisation of impact on the feature

12.240 There is a slight possibility that hedgerows along School Lane, Stoney Lane or the A49 might be subject to dust deposition during construction if haul road run alongside them, but the construction period for each phase is unlikely to extend beyond one growing season anyway and neither Stoney nor School Lane are likely to be key access routes for site traffic as these pass residential houses, so this risk is unlikely to arise.

Construction Site Hazards (Direct Killing/Injury/Destruction)

12.241 Bats are protected by law from killing or injury. Common toads are not afforded such protection, but as a UK BAP Priority Species any such impact would be considered undesirable and not in keeping with biodiversity conservation objectives or the legislative framework for protection of biodiversity as this could exacerbate population decline at The Site in combination with foraging and breeding habitat loss.

Bats

Killing/injury: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.242 Development of the Site will have no direct impact upon bats as there are no roosts present. Clearance of woodland and trees has no potential to disturb, injure or kill any roosting bats.

Characterisation of impact on the feature

12.243 There are no bat roosts present and construction phase activities are not considered likely to cause direct killing or injury to bats that use The Site for foraging or commuting.

Rationale for prediction of effect on integrity or conservation status

12.244 Direct killing and injury of bats is only likely to occur if works to trees with roosts occur when bats are present. As such works could have an adverse impact directly upon the local population. However detailed surveys have shown that there are no bat roosts currently on Site.

Significance of impact

12.245 In the absence of mitigation, construction site hazard impacts upon bats are considered to be negligible.

Common Toad

Common Toad: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.246 Development of the Site (demolition and construction) will result in the disturbance to and terrestrial and aquatic habitats where Common Toad may be present and represents a significant risk of killing or injury to individuals.

12.247 There will be damage to and loss of ponds and foraging/resting vegetation during site clearance that would have the potential to kill or injure any Common Toad present. Direct killing and injury of Common Toad is likely to occur during works to remove/disturb habitat. As such works would have impacts on eggs, larvae, juveniles and adults within ponds and in terrestrial habitat, and there would be a significant impact upon the existing breeding population. Impacts on Common Toad through killing/injury are considered reasonably likely to occur. Therefore, mitigation measures to minimise impacts on this species are considered necessary.

Characterisation of impact on the feature

12.248 The above activity has clear potential to negatively affect Common Toad adults, larvae or eggs present.

Rationale for prediction of effect on integrity or conservation status

12.249 The Site has been shown to support only a low population of Common Toad.

Significance of impact

12.250 It is anticipated that, in the absence of mitigation, the construction phase of the Development could result in a significant negative impact on Common Toad at the Borough level. Whilst legal protection of Common Toad is minimal killing or injury should be avoided and measures must be taken to safeguard Common Toad prior to any works taking place.

Birds

Killing/injury: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.251 Development of the Site involves vegetation clearance that will take place early in the schedule of Site clearance. This habitat removal has the potential to have a direct impact through killing or injury of eggs or young chicks in nests. This applies to scrub, scattered trees, plantation and hedgerow habitats within The Site.

12.252 Vegetation destruction during site clearance has the potential to kill or injure any eggs or young chicks in nests at the time of works. Embedded mitigation in the form of avoidance has been built into the scheme, but in the absence of mitigation, the impacts on eggs or chicks through killing/injury could be significant.

Characterisation of impact on the feature

12.253 The clearance of vegetation on Site would result in a short-term direct adverse impact upon the local breeding bird population. Recruitment to the local bird population could be affected in the short-term if no second brood is laid by these birds elsewhere within the same breeding season.

Rationale for prediction of effect on integrity or conservation status

12.254 Direct killing and injury of birds is only likely to occur if works to remove habitat occur during the bird nesting season. Four red-listed species of national conservation concern present at Site could be impacted (house sparrow, song thrush, starling and yellowhammer). There would be a legislative consequence to such reckless actions as breeding birds are afforded legal protection.

Significance of impact

12.255 In the absence of mitigation, the impact upon breeding birds at Site would result in a significant adverse impact at the Site Level. However, the absence of mitigation would constitute an offence punishable by prosecution, so a lack of mitigation is not considered a realistic eventuality and this risk is covered within the embedded mitigation for the Site.

Construction Impacts on Wider Biodiversity

Land-Take (Habitat Loss)

Species-poor semi-improved grassland

Semi-improved grassland: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.256 Development of the Site will result in the loss of the vast majority of existing semi-improved grassland.

12.257 The grassland is not considered to meet Priority Habitat, LBAP or BHS criteria as the grassland has been subject to agricultural improvement and is not floristically diverse. It is therefore considered that the unmitigated loss of semi-improved grassland could result in an adverse effect of local significance.

12.258 Although the loss of semi-improved grassland is permanent, this habitat type is considered to have low biodiversity value due to a lack of floristic and structural diversity that has arisen as a result of long-term agricultural use. Some of the grassland is within the Lancashire Grassland Network, as such whilst still species poor, this has elevated value from a strategic standpoint.

Characterisation of impact on the feature

12.259 All of the grassland to be lost is classed as species-poor, has been subject to agricultural improvement and does not meet LBAP or BHS guidelines. Some of the grassland is within the Lancashire Grassland Network, as such whilst still species poor, this has elevated value from a strategic standpoint.

Rationale for prediction of effect on integrity or conservation status

12.260 Some of the grassland is within the Lancashire Grassland Network, as such whilst still species poor, this has elevated value from a strategic standpoint.

Significance of impact

12.261 In the absence of mitigation, the operational phase of the Development will result in a permanent negative impact upon the extent of grassland habitat. There are no important species, either flora or fauna, associated with this habitat at the Site. Significant negative effects in ES are those that undermine biodiversity conservation objectives. The loss of semi-improved grassland at the site is recognised to have a local impact in respect of that outside the Lancashire Grassland Network and a Borough level impact within it, this impact is considered to be significant as, although there are no conservation objectives attached to species-poor semi-improved grassland the scale of the loss and inadequate compensation mean that there will be a net loss of biodiversity.

Ponds

Ponds: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.262 Development of the Site will result in the permanent loss all ponds which are classed as priority habitat.

Characterisation of impact on the feature

12.263 All of the ponds to be lost are classed as a BAP habitat due to the presence of Common Toad.

Rationale for prediction of effect on integrity or conservation status

12.264 The ponds on the Site have low diversity and limited ecological value for the habitat type, however they do represent one of the more important habitat types on an ecologically impoverished Site due to the presence of Common Toad.

Significance of impact

12.265 It is anticipated that, in the absence of mitigation, the operational phase of the development will result in a significant permanent negative impact upon pond habitat at the Borough level.

Running water

Running water: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.266 Development of the Site will result in the retention, of existing running water habitat on Site. Therefore there will be no impact upon running water due to permanent land take.

Characterisation of impact on the feature

12.267 There will be no loss of habitat (land take) that will negatively affect running water.

Rationale for prediction of effect on integrity or conservation status

12.268 N/A

Significance of impact

12.269 It is anticipated that, in the absence of mitigation, the development will have negligible impact on running water habitat.

Marshy grassland

Marshy grassland: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.270 Development of the Site will result in the loss of existing marshy grassland.

Characterisation of impact on the feature

12.271 Most of the marshy grassland to be lost is classed as species-poor rush pasture. Some areas are more species-rich locally, but all of the habitat on Site has been subject to agricultural improvement and does not meet LBAP or BHS guidelines. Marshy grassland creation associated with wetland and swale creation with marginal planting will use species-rich mixtures of native species which will have significantly higher ecological value than rush pasture.

Rationale for prediction of effect on integrity or conservation status

12.272 Some of the grassland is within the Lancashire Grassland Network, as such whilst still species poor, this has elevated value from a strategic standpoint.

Significance of impact

12.273 In the absence of mitigation, the operational phase of the Development will result in a permanent negative impact upon the extent of marshy grassland habitat. There are no important species, either flora or fauna, associated with this habitat at the Site. Significant negative effects in ES are those that undermine biodiversity conservation objectives. The loss of marshy grassland at the site is recognised to have a local impact in respect of that outside the Lancashire Grassland Network and a Borough level impact within it. This impact is considered to be significant as, although there are no conservation objectives attached to species-poor semi-improved grassland the scale of the loss and inadequate compensation mean that there will be a net loss of biodiversity.

Scrub

Scrub: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.274 Development of the Site will result in no loss of scrub.

Characterisation of impact on the feature

12.275 N/A

Rationale for prediction of effect on integrity or conservation status

12.276 This habitat at the Site has low ecological value and has no biodiversity conservation objectives attached.

Significance of impact

12.277 It is anticipated that, in the absence of mitigation, there will be no impact on this habitat.

Scattered tress

Scattered trees: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.278 Development of the Site will result in the loss of scattered trees particularly along hedgerows that are planned for removal within the site.

Characterisation of impact on the feature

12.279 Across the Site there will be a loss of mature scattered trees. Typically these are pedunculate oak and sycamore. Some of these are classified as veteran trees.

Rationale for prediction of effect on integrity or conservation status

12.280 The trees being lost to the Development have their own inherent nature conservation value, but they are all common and widespread species and no particular biodiversity conservation objective has been allocated to them. However, many of these are aged specimens and some are classified as veteran and collectively they make an important contribution to the overall biodiversity of the Site.

Significance of impact

12.281 It is anticipated that, in the absence of mitigation there will be a negative impact upon scattered trees, which is significant at the borough level as mature and veteran trees cannot be compensated. Loss of trees assessed in relation to hedgerows.

Tall ruderal

Ruderal vegetation: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.282 Development of the Site will result in the loss of the existing tall ruderal vegetation.

Characterisation of impact on the feature

12.283 All of the ruderal habitat to be lost is classed as species-poor and does not meet LBAP or BHS guidelines. 100% of the habitat present on the site will be lost during construction.

Rationale for prediction of effect on integrity or conservation status

12.284 This type of habitat has low ecological value and has no biodiversity conservation objectives attached.

Significance of impact

12.285 It is anticipated that, in the absence of mitigation, the construction phase of the Site will result in a permanent negative impact upon the extent of ruderal habitat, however this is not considered to be ecologically significant alone, although the impact needs to be assessed in the context of overall biodiversity at the Site. This identifies additional habitat losses of semi-improved grassland and scrub it is judged that there is a net loss of biodiversity of these habitats which is significant at the Site Level.

Summary

12.286 Habitat loss arising from the construction phase will occur due to land take. Habitats of high ecological value have been discussed under Important Ecological Features (Hedgerow and Priority Ponds). Other habitats are common and widespread habitat types associated with agricultural improvement. These are summarised in Table 12.18 below.

Table 12.18: Summary of Notable Habitats and Impacts across the Site

Habitat subject to loss due to land-take	Area existing (Ha)	Area Lost during construction (Ha)
Species-poor semi improved grassland	33.05	33.05
Marshy grassland	4.69	4.69
Woodland	0.13	0.13
Scrub	2.63	Zero
Scattered trees	Within hedges	Within hedges
Hedge	4487 linear m	1370 linear m
Ponds	0.07	0.07

12.287 A temporary delay between the processes of land-take and compensatory habitat creation means that biodiversity benefits are not realised during the construction phase, and for habitats which take considerable time to reach maturity, such as woodland, the timeframe for temporary losses is long term.

Common Toad

Temporary habitat loss: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.288 Development of the Site will lead to the loss of all existing ponds during the construction phase due to land-take. This is a total loss of breeding habitat for common toad which is a UK BAP priority Species. Compensatory pond creation is taking place prior to construction.

Characterisation of impact on the feature

12.289 Currently ponds are well represented and widely distributed throughout the Site. Temporary loss of pond habitat and the geographical concentration of pond habitat post-construction have potential to negatively impact common toad breeding success.

Rationale for prediction of effect on integrity or conservation status

12.290 The common toad is in decline primarily due to habitat loss and particularly the loss of wetland breeding areas. The development continues this trend and adds to an undesirable negative impact on the likely breeding success of this UK BAP species at the Site.

Significance of impact

12.291 Common toads return to the same spawning ponds each year and creation of ponds in new geographical locations on Site has potential to lead to decreased breeding success.

Other Amphibians (smooth newt and common frog)

12.292 There will be a short to medium term impact upon amphibians whilst created habitats establish. Pond creation and establishment to create breeding habitat is achievable over relatively short time-scales, however the temporary loss of ponds and associated terrestrial habitat will have an impact on breeding and foraging habitat availability.

Hydrology and air quality (waterbodies and dust)

Waterbodies

12.293 In the absence of suitable mitigation, there is some potential for accidental pollution incidences of chemicals/fuel and silt-laden construction site run-off to affect retained running water habitat and any fauna within this. This could potentially lead to an adverse impact at a Local level on flora and fauna within the stream.

12.294 There is the potential for pollution impacts if there are not strict construction site management controls over issues such as location of compounds and storage of materials. Therefore protection measures for retained habitats, should be included in the CEMP and clearly marked on the ground. Clear site induction process, the use of markers and barriers and the application of the CEMP by site management will ensure accidental habitat damage through pollution incidents does not occur.

Dust

12.295 Dust from demolition and construction sites deposited on vegetation may create ecological stress within the local plant community. During long dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Rainfall removes the deposited dust from foliage and can rapidly leach chemicals into the soil. Plant communities near short-term construction works are likely to recover within a year of the dust soiling stress ceasing (Holman, C. et al (2014).

12.296 Legislation is in place that regulates dust emissions from construction sites but additional likelihood of impacts can arise as a result of an increase in airborne dust during periods of dry weather when soil-stripping/earth moving is being undertaken for example.

12.297 A large proportion of the emissions result from site plant and road vehicles moving over temporary roads and open ground, therefore dust suppression measures including damping with water can effectively control this impact and therefore the no significant impact from dust on adjacent vegetation and species is anticipated. To successfully address this issue and ensure no adverse impacts, specific dust control mitigation will be secured within the CEMP which should be required by a planning condition.

Other Amphibians (smooth newt and common frog)

Killing/injury: (Proposed activity, duration of activity, biophysical change and relevance to receptor).

12.298 The only other principle species group at the site which is likely to be present and which the development will have clear consequences upon, are the amphibians. This group is in decline and the pond surveys revealed their presence on the Site. Development of the Site will involve the loss of all existing ponds and vegetation clearance that will take place early in the schedule of the Site clearance. This has the potential to have a direct impact through killing or injury of smooth newts and common frogs.

Characterisation of impact on the feature

12.299 Currently ponds are well represented and widely distributed throughout the Site. If it were to occur, the permanent loss of pond habitat has potential to negatively impact common toad breeding success.

12.300 The clearance of ponds and associated terrestrial habitats within the site would result in a highly likely adverse impact upon the local breeding populations of smooth newt and common frog due to killing and injury as a result of the adverse impact habitat losses during the construction phase. 100% of the breeding ponds for these species at the Site will be lost and large areas of associated terrestrial habitat.

Rationale for prediction of effect on integrity or conservation status

12.301 Amphibians return to the same spawning ponds each year and these are all being lost. Direct killing and injury of amphibians is likely to occur as works to remove habitat will affect these species during active seasons and hibernation.

Significance of impact

12.302 In the absence of mitigation, the impact upon other amphibians at the Site would result in a significant adverse impact at the Site Level. This would have a negative effect on biodiversity conservation objectives as the common toad and other amphibians at the site.

Operational Impacts

12.303 Operational impacts are those identified as having potential to have impacts post-construction due to long term environmental changes.

12.304 The operational impacts we have identified through scoping are as follows:

- Disturbance (lighting on bats, human impacts upon ponds, predation by cats and visitor pressure on nearby designated sites)
- Hydrology & Air quality

12.305 As was the case for construction Impacts, we have identified that the above operational impacts need to be discussed in relation to the following important ecological receptors:

1. Designated Sites
2. Hedgerow (Priority habitat)
3. Ponds (Priority habitat)
4. Common Toads
5. Bats
6. Breeding birds

Operational Impacts on Important Ecological Features

Disturbance (e.g. lighting & visitor pressure)

Designated Sites: Preston Junction LNR, Cuerden Valley Park & River Lostock BHS

Designated Sites: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.306 Development of the Site has potential to increase visitor pressure on local designated nature conservation sites.

12.307 In consideration of recreation and disturbance impacts on habitats and species at these designated sites, it is necessary to have an idea of the ecological value of the Site and some idea of how visitor impact might increase as a result of the Development.

Characterisation of impact on the feature

12.308 It is important to note that neither the LNR nor the BHS are contiguous with the Site. Increased visitor pressure can result in a range of impacts on conservation sites depending upon the interest features of the Site and fragility of these in relation to disturbance. Such impacts include trampling effects on vegetation, undesirable damage through activities such as littering, fly tipping, vandalism and arson, disturbance to wildlife such as breeding birds and incompatibility with site conservation objectives.

12.309 There is a considerable resource of published information on the effects of visitor pressure on species and habitats, but this tends to be generic. The assessment of and mitigation for any potential impacts at Preston Junction LNR and Cuerden Valley Park & River Lostock BHS will need to address the particular features of both sites.

12.310 Preston Junction LNR is open to public access and contains established paths which take most visitor passage. The site supports grassland and scrub habitats which are resilient to trampling effects. The other important factor of Presto Junction is that it is a former railway line. As such, there is a clearly delineated pathway and the site is linear following a route between embankments and cuttings.

12.311 Cuerden Valley Park & River Lostock BHS covers 54ha and is part of the larger Cuerden Valley Country Park which covers 263ha. The Country Park includes 121ha of agricultural land and 48.5ha of woodland, with other principle habitats being lake, ponds and the River Lostock. Free and open visitor access is encouraged throughout the Country Park with it being well provisioned with a comprehensive network of permissive footpaths.

12.312 The Country Park Cuerden Valley Park is a public resource and therefore already experiences visitor pressures, and public as well as site management strategies are already in place such as the provision of paths and walkways which limit trampling and disturbance effects on sensitive features. The BHS does contain habitats which are sensitive to trampling effects, notably flushed grassland and marshy grassland communities. The site also supports breeding bird species which may be sensitive to increased disturbance.

Rationale for prediction of effect on integrity or conservation status

12.313 The fact that Preston Junction follows the former railway line means that the opportunities for visitors to leave the route and cause any direct impacts upon flora and fauna are somewhat limited. The Cuerden Valley Park BHS also has an extensive and well-marked network of footpaths and cycleways throughout. Both sites might therefore be quite robust to increased visitor activity within these managed areas without detriment to the nature conservation interest therein.

12.314 Both the LNR and the BHS support wildlife populations which may well be relatively robust from noise disturbance. There is no weight of evidence to suggest that groups such as butterflies, small mammals, breeding birds will be adversely impacted as long as their habitat is maintained. Indeed, a regular and constant increase in public activity at either site is likely to result in a habituation response by the wildlife, so that no discernible negative impacts arise.

12.315 However, what is clear is that unregulated public access to habitats such as grasslands and woodlands within these wildlife sites could result in trampling and compaction effects which would reduce the nature conservation value of the habitats. Greater public pressure also increases the chances of negative impacts upon habitats such as wildlife ponds, which may become prone to introduction of fish and creation of informal fisheries, which harm the nature conservation value of the ponds.

Significance of impact

12.316 No data is available to quantify the potential impacts upon wildlife and habitats within the Preston Junction LNR or the Cuerden Valley Park & River Lostock BHS. However, in the absence of mitigation, the creation of a large 'destination' mixed use development has the potential to generate considerable numbers of additional visitor to both site, Cuerden Valley Park & River Lostock BHS in particular as it the closest of the two nature conservation sites to the Development. Even if only a very small percentage of visitors to the new Site decide to cross the A59 to visit the BHS, then there could be a considerable increase in footfall within it. Overall, it is concluded that there could be an adverse impact upon the BHS which would be significant at the local level.

Hedgerow

12.317 Disturbance effects have been scoped out during the operational phase upon this habitat.

Ponds

12.318 Disturbance effects have been scoped out during the operational phase upon this habitat.

Bats

Bats: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.319 The Site is already exposed to high ambient light levels throughout the night as a result of its proximity to nearby conurbations and road infrastructure. It is inevitable that, even with mitigation in place, the additional infrastructure will result in increased nocturnal light levels during the operational phase of the Site.

12.320 Any outcome that results in bats displaying avoidance behaviour of the area would be unfavourable. Artificial light pollution has potential to have a negative impact on bats that use the Site, affecting bat flight-paths and foraging behaviour.

Characterisation of impact on the feature

12.321 Some bat species, particularly Myotis spp., are known to avoid illuminated areas, which may lead to reduced foraging success and survival rates. Furthermore, the introduction of artificial lighting in proximity to favoured bat foraging areas has the potential to increase the risk of bat mortality arising from owl and cat predation.

Rationale for prediction of effect on integrity or conservation status

12.322 Research into the impact of artificial lighting upon bats has provided evidence that light pollution may force bats to use suboptimal flight routes, potentially causing isolation of preferred foraging sites (Stone et al 2009).[xxiv]

12.323 In the absence of mitigation, lighting of habitat corridors, such as hedgerows or tree lines may indirectly have an adverse impact upon bats. Although overall bat activity at the Site is low, in the absence of mitigation it is considered that lighting could result in an adverse effect upon bats at a Local level.

Significance of impact

12.324 It is anticipated that, in the absence of mitigation, the operational phase of the Development will result in a negative impact on bats that would be significant at the Site due to disturbance of behavioural patterns arising from unsuitable artificial lighting effects.

Common Toad

Common Toad: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.325 Operational disturbance impacts (including noise and light pollution, vibration, human and vehicular activity) may lead to some disturbance around the scheme which could have an impact upon pond habitats and Common Toads. The scale of un-mitigated construction impacts upon this species would be so considerable, that a population would be unlikely to persist through to the operational phases, so this disturbance impact is negligible.

Characterisation of impact on the feature

12.326 The key issue of concern arising from disturbance arises from the risk of human interference in the ponds which are key to Common Toad breeding and the long-term survival of localised populations.

Rationale for prediction of effect on integrity or conservation status

12.327 It will be essential to ensure that, if any Common Toads persist at the Site post-construction, their breeding and terrestrial habitat should be protected and managed in the long-term to ensure the population is robust. Measures to make ponds less accessible to visitors will be particularly important to ensure breeding habitat is retained to maximise viability.

Significance of impact

12.328 It is anticipated that, in the absence of mitigation, the operational phase of the Site Common Toad would potentially be subject to disturbance impacts.

Breeding Birds

Breeding birds: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.329 The presence of people and noise arising from activities at the Site during its operational phase will mean that there is long-term potential for disturbance to be maintained at a level which is elevated compared to the existing Site conditions

Characterisation of impact on the feature

12.330 The only operational impact which we have identified which could impact upon the assemblage of relatively common and widespread birds on the site arises from the fact that there will be a significant increase in public use of the Site, particularly in the habitat areas associated with the residential development and public open spaces. This will increase the potential for disturbance of wildlife.

12.331 Fortunately, there are no ground nesting species associated with the Site, as these are the birds which research reveals are subject to greatest disturbance impacts. The passerine dominated avifauna at the Site is already exposed to relatively high levels of anthropogenic noise, vibration and lighting, so no pathways to significant disturbance of this nature is predicted to arise as the bird species that use the wider landholding are considered to be resilient to post-construction low levels of disturbance.

12.332 There is potential for increased predation of wildlife resulting from an increase in domestic pets associated within Zone E (residential dwellings) of the Development. It would be expected that wildlife, particularly birds and small mammals associated with retained habitats, might be subject to increased predation and disturbance, particularly from cats.

Rationale for prediction of effect on integrity or conservation status

12.333 Birds are considered unlikely to be affected by an increase in use of the area by humans. These species are likely to become habituated to low intensity disturbance effects, such as an increase in human presence and associated ambient noise.

12.334 In relation to bird predation by cats, recent research is inconclusive as to the actual effect that domestic cats can have on wild bird populations, however, a precautionary approach is advised. xxv

12.335 The potential adverse impact is however of concern, as it may affect breeding birds of conservation concern, such as the low numbers of red listed species at the site. Churcher & Lawton xxvi calculated that in a single English village, cats were responsible for up to 30% of mortality in a house sparrow population.

Significance of impact

12.336 It is anticipated that, in the absence of mitigation, the operational phase of the Development will result in a long-term negative impact upon birds as a result of cat predation. This will be significant at the site level.

Hydrology & Air quality

12.337 The only important ecological receptor that has been identified as potentially vulnerable to hydrology and air quality issues during the operational phase of the Site are the Designated Nature Conservation sites. All other ecological receptors, such a hedgerows, bats and common toad have been scoped out as a mixed use development of this type does not produce known significant pathways to cause impacts upon these receptors.

Designated Sites: Preston Junction LNR, Cuerden Valley Park & River Lostock BHS

Hydrology and Air Quality: (Proposed activity, duration of activity, biophysical change and relevance to receptor)

12.338 The operation of the Development has the potential to alter water resources and quality discharging from the Site. There is also the possibility that the operations of this Development could generate atmospheric discharges that might conceivably have an adverse impact upon sensitive ecological receptors.

Characterisation of impact on the feature

12.339 The existing ditch network within the Site which drains into the River Lostock will be maintained throughout the operational life of the scheme. A Sustainable Urban Drainage System and attenuation features within the Site will control discharges and prevent pluvial flooding. If pollution events on the site took place then they could potentially have an adverse impact upon fisheries interests and the river ecosystem in any downstream watercourses. Even if these discharge points are downstream of a protected conservation site, there could still be a negative impact upon the nature conservation interest of the protected site because fish and birds will readily move throughout the watercourses. Drainage and pollution prevention therefore need to be addressed on-site.

12.340 Air quality impacts generated by the site could potentially have an adverse impact upon habitats which a susceptible to atmospheric pollutants. Sites indicative of high air quality for example, comprise habitats with high proportions of lichens and mosses, such as peat bogs. However, it is clear that the geographical location of the Site that no such habitats are present within the nearby designated nature conservation sites.

Rationale for prediction of effect on integrity or conservation status

12.341 There are no anticipated significant operational impacts on either of the designated nature conservation sites in relation to air quality or pollution. Any atmospheric emissions, wastewater, surface runoff etc produced during the operational phase of the development will be controlled according to the established UK legislative framework for air quality and water treatment. The Air Quality Chapter of the Environmental Statement scopes out any air quality issues arising from the site beyond 50m and the BHS lies upstream of the discharge points into the River Lostock. The Water Resources chapter of the Environmental Statement states that the development will not increase site run-off and neither is it likely to result in groundwater pollution. In addition, the Sustainable Urban Drainage System (SUDS) and foul water drainage will control water quality discharges.

Significance of impact

12.342 It is concluded that dust and noise disturbance impacts will be insignificant due to the distance from the Site, the anticipated low emissions and as a result of the embedded mitigation measures. Likewise, there will be no significant water quality or resource impacts upon the Cuerden Valley and River Lostock BHS as it lies upstream of the site's discharge point and mechanisms will be built in to the site drainage system to contain and control any pollution events which might arise.

Mitigation Measures

12.343 In the previous Section it has been identified that, prior to mitigation, the Development has potentially significant effects on important ecological features which have specific biodiversity conservation objectives. These are the net loss of hedgerow priority habitat, net loss of pond priority habitat, potential for harm to Common toad, potential for adverse effects on bats, and the loss of breeding bird habitat.

12.344 The following section details specific mitigation at the Site aimed at reducing any specific impacts upon species and habitats which have been identified as potentially significant. In addition to specific measures, mitigation for potential impacts during construction would be delivered through implementation of a CEMP.

12.345 The scheme should ideally deliver net ecological gains on completion, and that the design should wherever possible avoid significant ecological impacts. Where the latter is not possible any negative impacts should be reduced (mitigated for) and any remaining impacts compensated for.

12.346 Where mitigation alone will not suffice, then additional compensation measures will also need to be fully discussed.

12.347 In the absence of mitigation, the potentially significant impacts upon habitats and species have been identified as:

Important ecological features:

- Potential visitor pressure disturbance to nearby designated sites
- Loss of priority hedgerow habitat;
- Loss of priority pond habitat;
- Injury or killing of Common Toad;
- Loss of habitat for Common Toad;
- Loss of foraging/commuting habitat for bats;
- Illumination effects on bats;
- Disturbance of Breeding Birds and Loss of Habitat;

Wider biodiversity:

- Loss of scattered trees;
- Loss of habitat & killing/injury of other amphibians;
- Pollution, noise and airborne dust;
- Site-wide mitigation.

Important Ecological Features

Visitor pressure disturbance of Designated sites

12.348 The Site will generate an unquantified increase in visitor pressure upon the nearby Cuerden Valley & River Lostock BHS. It will be necessary to identify a mechanism to protect the nature conservation features of the BHS. In particular, the woodland and grassland components may well be vulnerable to physical compaction and trampling impacts arising from an increase in footfall, especially if this is not managed.

12.349 As mitigation, it is recommended that a financial contribution is agreed with the land managers of the BHS in order that they might best deliver the management measures needed to protect this Site in the long-term. No other mitigation measures are likely to be required as this will successfully address any impacts arising from the Site.

Loss of Priority Hedgerow Habitat

12.350 The application involves the loss of species rich and species-poor hedgerow. All the hedgerow to be lost meets the priority habitat definition based upon composition of native species, all 'important' hedgerows will be retained. A total of 1317m of hedgerow will be lost. The landscape plan provides compensatory planting native hedgerow of 2875m.

12.351 There will be a medium to long term delay between hedgerow destruction and the establishment of new hedgerow with comparable ecological value. Consequently, in the short-term the new hedgerow will not equate to the same level of ecological function provided by the existing network of field boundaries. The timescale for recreation of these habitats takes several years, and therefore there is predicted to be a short to mid-term reduction in hedgerow quality that will impact upon species such as bats foraging and commuting habitat until these habitats establish. However, in the long-term there will be no residual impact arising from the scheme as the Landscape Plan will adequately compensate for the hedgerow that is being lost.

Loss of Priority Pond Habitat

12.352 The Development involves the loss of priority ponds which were classified on the presence of Common Toad. Mitigation is therefore required to ensure no net loss of priority pond habitat and no net loss of Common Toad habitat, which are classed as separate habitat and species impacts, but in practical terms the mitigation requirements have the same applications and outcomes.

12.353 To address this issue a scheme of compensatory habitat creation has been devised. Ponds will be created cumulatively providing 6848m2 of open water habitat against 256m2 lost. The establishment of Common Toad within the new suitable ponds and surrounding terrestrial habitat will be undertaken prior to the start of development works.

12.354 With this mitigation in place the Development of the Site during phase will not result in the net loss of priority pond habitat.

Injury or Killing of Common Toad

12.355 There are three ponds on the Site found to support a population of Common Toad, therefore to ensure no impacts there will need to be mitigation and compensation measures to address the habitat loss and the potential for injury and killing of Common Toad. Infilling of ponds would have a significant impact upon the Common Toad population and individuals, as the probable extinction of the species at the Site would be a negative impact at a borough level on a breeding population.

12.356 By way of mitigation, between August and October when juvenile Common Toad will be fully formed and before hibernation, ponds will be drained and Common Toad will be trapped which will ensure there is no killing or injuring of this species. These animals will be relocated to the on-Site ponds which are to be created specifically for Common Toad mitigation. As the Common Toad population will be translocated to the created ponds, these will provide adequate compensation for the impact upon priority pond habitat. This would ensure no residual impacts upon individual animals.

Loss of Habitat for Common Toad

12.357 The Site plan incorporates the creation of new ponds in an area with native grassland, tree and scrub habitats within the Site provide suitable for Common Toad breeding and foraging.

12.358 The above measures will ensure that there will be no temporary or permanent loss of the Common Toad population within the Site, and mitigation will ensure that there will be no negative impact on the individuals or population as a whole. The favourable conservation status of this species at the parish level will be maintained. It is concluded that the overall package of mitigation and compensation will have a neutral effect upon the species and therefore no residual impacts (positive or negative) will arise.

Loss of foraging/commuting habitats for bats

12.359 Surveys showed that the levels of bat usage at the Site are generally low, overall habitat suitability is poor, and most of the Site showed extremely low usage. Only three areas showed more frequent usage – part of Stoney Lane, a small section of Old School Lane and hedgerows to the southern part of The Site. Of these, the linear features and tree lines of Stoney Lane will be retained and the area used by bats along the southern section of Old School Lane is excluded from the Development.

12.360 It is probable that overall low usage by bats is at least partly explained by the fact that much adjacent habitat is poor for bats, the Site has poor overall suitability for bats and linear features (hedgerows) within the Site do not have good inherent continuity or have connectivity with other features, such as woodland foraging areas outside the Site (for example at Cuerden Valley).

12.361 There are no bat roosts on Site, although there are a number of trees which contain PRFs. These PRFs within mature trees should be considered as a potential habitat resource for bats at the site. The fact that there is no direct roost loss means that no mitigation or compensation is necessary pertaining to roosts and the injury or killing of roosting bats therein. However, there will be a diminution of woodland cover with PRFs and these should be compensated for to ensure no net loss of biodiversity. It is recommended that a number of PRFs are sectionally removed from trees during soft felling and these, in addition with provision of artificial bat roosts, should be placed on retained trees within suitable mature trees on the Site which are in favourable dark habitat. This measure will ensure no net loss of overall PRFs across the Site.

12.362 The erection of 20 artificial tree bat roosts prior to the project start date will mitigate for loss of any potential bat roosts which were identified in natural tree features, thus there is no residual impact on bat roosting potential.

12.363 Disturbance during construction and operational phases is not likely to have a significant impact upon bat populations or individuals, as construction will not occur during hours of darkness and it has already been established that flight lines are the only use of the Site by bats so the scheme will not affect breeding, rearing, or hibernation as evidenced by the lack of roosts. There is no roost on the Site that could be disturbed by noise or other impacts, and no night working will ensure an absence of noise or light disturbance at night during the construction phase.

12.364 One of the key elements of mitigation that has been built into the masterplan through negotiation is the retention and enhancement of the trees and species-rich hedgerows which run down each side of Stoney Lane. This area had been identified as the most heavily used section of the Site by bats and it crosses the Site from east-west.

12.365 There will be some loss of habitat currently used by bats for foraging in the southern part of the Site with the loss of Pond 17 and nearby hedgerows. However, the creation of new pond areas with surrounding trees and scrub as part of the habitat compensation will offset this loss and which, in the long-term will provide increasingly suitable bat foraging habitat as it establishes.

12.366 The main commuting routes across the Site, along Stoney Lane and Old School Lane, will have habitat connectivity retained. Some minor severance may arise through Stoney Lane where the new road crosses the Lane. Efforts to ensure maximum possible tree retention combined with a lighting sensitive scheme at this point should ensure no loss of connectivity. In addition, along the length of School Lane the new habitat creation will protect and enhance the existing bat flight and foraging habitat.

12.367 Hedgerows are widely used as bat flight lines. To minimise any potential impact to bat foraging routes retained and newly created hedgerows should be reinforced with native species planting if moribund areas or breaks are identified. In order to mitigate for potential mortality due to increased traffic movement, the lower branches of any trees alongside roads should be regularly pruned back to the trunk in order to ensure that the most suitable flight line is under the canopy rather than out by traffic.

12.368 Creation of new hedgerows and woodland/scrub within the Site will create habitats that will become suitable for bat roosting in the long term and foraging in the short to medium term. Tree mounted bat boxes will be installed prior to scheme initiation to mitigate for loss of any potential roosting features by felling. Creation of new ponds will provide invertebrate food resources for foraging areas in the short-term. This will mitigate for the loss of existing habitats at the site, as existing habitat is known to be ecologically poor for bats, and survey confirmed that there were only low levels of bat activity over the majority of the Site which comprised the semi-improved pastures.

Illumination Effects on Bats

12.369 It is important to ensure that lighting does not spill light beyond where it is needed, and in particular not laterally into the surrounding vegetation or upwards into the sky as this is known to depress levels of bat activity through avoidance behaviour. Achieving this mitigation can be delivered through the use and correct adjustment of appropriate lighting units.

12.370 Measures to produce a wildlife sensitive public realm lighting scheme which minimises light impacts within the proposed new development should be employed as follows Bat Conservation Trust (2008): [xxvii]

- The level of artificial lighting including flood lighting throughout the Masterplan should be kept to a minimum;

- Where this does not conflict with health and safety and or security requirements, the Site should be kept dark during peak bat activity periods (0 to 1.5 hours after sunset and 1.5 hours before sunrise;
- Lighting that is required for security or safety reasons should use a lamp of no greater than 2000 lumens (150 Watts) and should use sensor activated lamps;
- Low pressure sodium lights are a preferred option to high pressure sodium or mercury lamps;
- Lighting should be directed to where it is needed with minimal light spillage. This can be achieved by limiting the height of the lighting columns and by using as steep a downward angle as possible and/or a shield or hood that directs the light below the horizontal plane; and
- Artificial lighting should not directly illuminate any potential bat roosting features or habitats of value to foraging bats that have been identified. In particular light spillage onto linear habitat that may be used as a commuting route should be avoided.
- Where road safety guidelines allow, roads along hedgerows should be unlit to provide dark stretches.
- Timed dark periods throughout the night when lighting is turned off should be combined with the use of low-level lighting columns to produce a lighting design that will reduce the likelihood of light spill upon potential bat flight lines.

Disturbance of Breeding Birds and Loss of Habitat

12.371 Two key reasons to reduce the impacts upon birds at the Site are the desire to minimise biodiversity impacts arising through construction/operational activities and also the legal protection afforded to all wild birds, their nests and eggs. Mitigation measures to achieve these dual aims can be delivered by ensuring that all vegetation clearance work will only be undertaken outside of the breeding season (typically March to August inclusive). Where this is not feasible, then vegetation will be cleared under an ecological watching brief to ensure no active nests are damaged or destroyed during the construction phase. If active nests are present, then an exclusion zone would need to be retained until the chicks had fledged as determined by the supervising ecologist.

12.372 In addition to the above nesting season mitigation measures, the loss of plantation woodland and hedgerow require compensation. There will be a net loss of hedgerow and woodland as previously discussed. New woodland and hedgerow planting will occur from project start, which provides a straightforward mechanism to partially mitigate against the loss of available potential bird nesting habitat.

12.373 Breeding habitat will be subject to a temporary adverse effect (loss and disturbance) during construction, as well as a permanent adverse effect post-construction (reduced availability of nesting habitat).

12.374 Post-construction compensation includes the provision of an enhanced area of suitable breeding habitat embedded in the design (buildings and associated tree and shrub planting). During and after construction provision of nest boxes will ensure continuity of nesting opportunities and should be secured by way of a planning condition.

12.375 For mitigation for the red listed house sparrow, species-specific nesting boxes should be used such as the 1SP Schwegler Sparrow Terrace. Sparrows are social and prefer to nest colonially. In addition, any on-site buildings could include specially designed features within their structure for house sparrows.

12.376 As well as general habitat provision, efforts to ensure the habitat requirements of species such as song thrush, starling and yellowhammer will help to focus upon the habitat compensation package. Compensatory habitat provision will also be necessary for the small numbers of these red listed birds. Compensatory nesting and habitat provision with song thrush is closely linked to the overall amount of permanent pasture available, so it is likely that song thrush will not be compensated for at the site.

12.377 Starlings may well gain new nest sites as a result of the new buildings being constructed on the site, so the loss of mature scattered trees with cavities in them and agricultural buildings will be compensated for. However, the loss of open grassland will reduce foraging opportunities at the site, although the short grass areas created will still provide some suitable foraging.

12.378 Yellowhammer is also likely to be adversely impacted by the overall scheme. This species will see a decline in suitable foraging habitat across the site as overall grassland area decreases markedly and is replaced with amenity grassland which is unfavourable for this species.

12.379 For general mitigation for common and widespread species, it is recommended that 30 bird boxes are installed across the Site. Boxes should include a combination of models suitable for colonial, semi-colonial and territorial species. Where possible the following guidelines should be followed:

- With exception to orientating the box due south, the direction that it faces makes little difference provided that it is sheltered from prevailing wind, rain and strong sunlight. The sector from north through east to south-east is possibly the most favourable.
- Boxes should not be positioned on the West facing side of a tree trunk where the rain water flows down heavily. It is usually possible to see where the rain water runs down the trunk from the growth of green algae.
- Small boxes should be angled forwards to give additional shelter to the entrance. Larger open boxes should be mounted tilted slightly upwards so that the nest rests naturally in the rearmost part of the box.
- For many common songbird species the height of the box from ground level is not important and may range from a height of 1m upwards.
- It is preferable to site nest boxes in locations that are accessible for maintenance, away from bird feeders, a discrete distance away from other nest boxes (unless targeting a colonial species) and so that they provide some protection from predators and vandalism.
- Standard hole and open fronted boxes can be attached at varying heights using either standard hanging devices or bespoke attachments to suitable structures.

12.380 Overall, despite these mitigation and habitat compensation measures, across the range of red and amber listed species, it is concluded that a residual negative impact at the site level will arise (see Residual Effects).

Wider Biodiversity

12.381 This section provides details on overall mitigation and compensatory measures which are recommended to be incorporated into the scheme to ensure that impacts on wider biodiversity at the Site are minimised. The main reason to mitigate/compensate for any direct loss of habitat or to species is to meet the policy aim of no net loss of biodiversity.

Loss of Scattered Trees

12.382 Across the Site there will be some extensive losses of scattered trees which are found within the hedgerows planned for removal. These trees have not been individually counted but it is likely to be several hundred, the majority of which are mature native oak, with to a lesser degree of sycamore.

12.383 In order to address these impacts, the Masterplan incorporates the planting of 544 new native trees. These will not address the short-term biodiversity loss of the scheme, but they will compensate for the loss of trees in the medium-term and beyond.

12.384 In addition to these measures to compensate for the loss of scattered trees across the site, it will also be important to ensure that all trees which are being retained are adequately protected during construction. Potential impacts at the construction stage to trees and hedgerows should be mitigated through adherence to British Standard 5837:2012 Trees in Relation to Construction. Implementation of Root Protection Zones and an Arboricultural Method Statement to guide construction works should be secured by way of a Planning Condition.

12.385 This should include the erection of a vertical barrier to protect trees and their root zones and the integrity of any other important habitats identified. Barriers are typically placed around the Root Protection Area (RPA). The minimum RPA distance is typically 12 times the stem diameter for single stemmed trees (measured 1.5m above ground level) and 10 times the basal diameter (measured immediately above the root flare) for trees with more than one stem arising below 1.5m above ground level. No works, tracking of heavy machinery or storage of materials should take place in protected areas. The contractor should erect ecological protection prior to any preliminary construction or preparation works. Regular checks should be made to ensure that the protection measures are intact and fenced habitats are not being impacted.

Disturbance, Habitat Loss, Killing and Injury of other amphibians

12.386 There are three ponds and associated habitat on Site found to support populations of common amphibians, therefore there are mitigation and compensation issues pertaining to habitat loss and the potential for a negative impact on the conservation status of common toad locally.

12.387 Creation of new ponds, with native grassland, tree and scrub habitats within the site provide suitable for common amphibian breeding and foraging.

12.388 Creation of ponds in new geographical locations on Site will ensure enduring amphibian breeding success.

Pollution, noise and dust

12.389 In December 2015 the Pollution Prevention Guidelines were withdrawn from use and have not been replaced, however as part of best practice methodology appropriate measures will be undertaken to ensure construction works are undertaken in an environmentally responsible manner and do not harm wider site biodiversity.

12.390 As identified at the start of the impacts section, embedded mitigation measures have been integrated into the proposals for the construction phase in order to reduce potential impacts from pollution, noise and dust. The possibility of fuel and other spillages during construction will be minimised through effective and rigorous CEMP include details of contingency planning should an accident occur. The CEMP should be implemented by way of a Planning Condition.

Site-wide Mitigation

12.391 As identified at the start of the impacts section, embedded mitigation measures have been integrated into the construction phase in order to reduce potential impacts from unnecessary direct loss of habitat. These measures will ensure that no additional land take outside the Development will arise and will be carefully controlled through the CEMP which should be implemented by way of a Planning Condition.

Watercourses

12.392 An un-named stream flows through the northern part of the Site. Mitigation for potential impacts to aquatic environments should follow procedures clearly detailed within the CEMP and in accordance with best practice which should still follow the archived Environment Agency's Pollution Prevention Guidelines (PPGs). PPGs include both general guidance on the prevention of pollution (such as PPG1 and PPG5) as well as specific guidance on subjects such as the storing and handling of materials/products, site drainage and dealing with sewage and trade effluents. Details on how the stream is to be protected from pollution during development should form part of the wider CEMP.

Semi-improved grassland

12.393 There will be a net loss of semi-natural habitat totalling 36.33ha, most of which is species-poor semi-improved and marshy grassland. Mitigation in the form of new grassland creation is proposed which covers 6.57ha. This means that a large percentage (82%) of the semi-improved grassland lost to Development will be a permanent loss. In respect of overall biodiversity value, it is considered that compensatory habitat creation, and the use of species-rich grass seed mixtures will compensate for loss of this area of habitat that has local value only.

12.394 Due to the nature of the scheme, large-scale habitat loss is inherent during the construction phase and much of this loss becomes permanent during the operational phase. The design for the scheme within the landholding does not allow for large scale compensation for inherent loss of habitat, as the development involves construction across the majority of its area. Due to the fact that it is impossible to avoid negative biodiversity impact during the operational phase, mechanisms off-site should be sought to deliver compensatory habitat management to ensure no net loss of biodiversity.

Impact Assessment Tabular Summary

12.395 The overall impacts of the scheme are summarised in table 12.19.

Table 12.19: Summary of Impacts on Habitats

Habitat		Existing Area/ Length	Area Post - construction (Hectares)	Change
Preston Junction LWS & Cuerden Valley & River Lostock BHS		No change in area	No change in area	Disturbance impacts
Hedge	Species-rich	400m	120m (Retained) 2857m (Planted)	+2577m
	Species-poor	3450m	2527m (Retained) 782m (Planted)	-141m
Semi-improved grass		50.955Ha	6.5767Ha	- 51.8623Ha
Marshy grassland		7.484Ha		
Amenity grassland		0	2.568Ha	+2.568Ha
Scattered Trees		Not measured	544 new trees planted	Increase but mature and veteran trees lost
Ponds		0.237Ha	0.3ha	+ 0.063Ha
Scrub		2.657Ha	Retained	-
Ornamental planting		0	0.6977 (non-native)	+0.6977Ha
Woodland		0.131Ha	1.909Ha	+ 1.778Ha
Stream		422m	Retained	-
Ditch		1183m	680m	- 503m

12.396 A summary of impacts resulting from construction and operation of the Site is presented in Table 12.20.

Table 12.20: Summary of Impacts on Species

Feature	Description of Impact
Bats	Species of principle importance that will have a neutral effect from the proposed development (Habitat severance will be offset by retained flight lines being enhanced, loss of linear foraging and commuting habitat will be offset by new hedge planting to the same linear extent, tree PRFs lost will be replaced and lighting disturbance will be mitigated.)
Common Toad	Species of principle importance that will be impacted by the proposed development (complete habitat loss) and possible direct injury and disturbance effects. These will all be mitigated and compensated for with new ponds and terrestrial habitat.
Breeding birds of conservation concern	Breeding birds of red list subject to severe population decline and therefore sensitive to negative impacts upon breeding success in terms of the maintenance of conservation status. Temporary nesting habitat disruption, loss of foraging habitat.
Wider Biodiversity	Overall loss of habitats has been mitigated in some cases (species-rich hedgerows) and others compensated for (hedges, ponds, woodland and scattered trees). However, the overall negative impact of the very large-scale loss of pasture which has not been compensated will bring about associated changes in the bird assemblage, loss of foraging and resting sites for small mammals, and introduction of new pressures such as cat predation will lead to an overall residual impact at the site.

Cumulative Effects

12.397 In order to assess whether there are any cumulative impacts upon potentially sensitive ecological features at the Site, a desk study was conducted to identify any other significant development sites within a 2km radius. Small and domestic projects were not taken into account as their likelihood of contributing to cumulative impact was considered to be de minimis. This search would form the basis to assess cumulative impacts upon the Site.

12.398 The only scheme likely to result in cumulative impacts is Lydiate Quarry Lydiate Lane Leyland Preston Lancashire PR25 4UB 07/2006/0672/CM - Adjacent to the southern boundary. There will be the progressive restoration of the quarry with the importation of materials. This is likely to result in landscaping and restoration of what is currently a structurally poor site. Cumulative impacts are therefore likely to be beneficial but not significant.

12.399 Other developments are considered outside the ZOI for any ecological receptors at the Site.

Residual Effects

Policy implications of residual impacts

12.400 After a thorough assessment of all ecological features at The Site, the nature of the proposed development and the likely impacts and mitigation, we conclude that there are significant residual impacts at the Site resulting from the development. The following section discusses the impacts upon the important ecological features in order to show where the residual impacts have arisen.

Designated Nature Conservation Sites

12.401 No designated nature conservation sites are present within the development footprint, so there will be no direct impacts of the Site during construction upon any nature conservation sites. However, the Cuerden Valley and Lostock Brook Biological Heritage Site lies directly opposite the site. There is the potential for the operational phase of the development to have a long-term adverse impact upon nearby nature conservation sites as a result of increases disturbance and physical damage. This could arise through greater visitor pressure resulting in unregulated access to sensitive habitats.

Protected species and species of conservation concern

Common Toad

12.402 With effective compensatory provision the development will have no long-term impact upon the Common Toad breeding and foraging habitats which are present within the Site. Compensatory provision of habitat in excess of current will provide an enhanced resource. There will be an increase in habitat area and quality and this will enable consolidation of the population at the site and secure its favourable conservation status.

12.403 There will be a possibility of direct construction impacts upon individual Common Toads within the build area but mitigation should reduce this.

12.404 Therefore the development proposal, with the proposed mitigation implemented, is considered to accord with policy.

Breeding birds

12.405 The Site environment will change from agricultural land dominated by semi-improved grassland to a site dominated by the built environment. It is recognised that the bird species assemblage is likely to change in composition and diversity, with the proposed development benefiting birds associated with more urban environs. The development has potential to have an adverse impact on breeding birds including 4 species which are listed in the red list of birds of conservation concern and 7 amber listed species. Habitat creation throughout the green infrastructure including tree and shrub planting and the provision of nest boxes is likely to mitigate impacts for some notable species such as house sparrow and song thrush. However, the resultant bird assemblage that develops is predicted to be smaller and less diverse than that currently encountered at the site.

12.406 Although the Site is not considered to be important for these species based upon the low numbers of breeding pairs present, there will be a net loss of suitable breeding habitat and therefore a reduction in overall suitability for breeding birds. Even though mitigation steps such as hedgerow planting and short-term provision of nest boxes are incorporated there will be a mid-term net loss of functional habitat and until this matures, so there will be a negative effect upon available nesting sites. In addition, there is no mitigation or compensation for the loss of grassland and this will result in an overall residual loss of foraging habitat which is significant at the site level.

12.407 There is considered to be a minor local impact on the small breeding bird populations that will be present post-construction as a result of overall loss of habitat. Although there is provision of partial mitigation in the form of retained habitat and compensation in the form of habitat creation there is predicted to be a residual impact upon these species which is relevant for planning policy.

Bats

12.408 The development has potential to have an adverse impact on small numbers of common and widespread bat species. No roosts will be impacted, but it is recommended that bat roosts are incorporated into the scheme to ensure ongoing provision of Potential Roost Features.

12.409 The short-term loss of hedgerow, woodland and standing water foraging and commuting habitat will arise. In the mid to long-term these losses are compensated for in the proposed scheme as the landscape and habitat design will compensate for the loss of the known low level of existing site use by bats. The loss of large areas of grassland will not have a significant negative impact as survey showed little or no bat activity in these areas and the compensatory planting measures will offset the loss of linear features within the site. In addition, the implementation of a bat sensitive lighting scheme should be a Planning Condition to ensure no long-term operational light pollution impacts upon flight lines within the site.

12.410 Due to the lack of roosts and low level of foraging activity on site, with the habitat compensation measures in place, no remaining impact on populations of bats within the zone of influence would be significant. It is concluded that the overall package of mitigation and compensation will have a neutral effect upon the species and therefore no residual impacts (positive or negative) will arise. Therefore the development proposal, with the proposed mitigation implemented, is considered to accord with policy.

Wider Biodiversity

12.411 Through the design process, the impact of the scheme has been mitigated by the retention and creation of habitats of highest ecological value (retention of species-rich hedgerows and re-establishment of priority ponds) as well as mitigation and compensation to avoid impacts upon bats and Common Toad. Small areas of grassland creation which are likely to be more species-rich than current and there will also be amenity grassland and ornamental planting. However these habitats will have very low ecological value. These gains are judged against the losses, which in the long-term will see a net loss of the following habitats:

- semi-improved grassland;
- marshy grassland;
- ruderal;
- Woodland

12.412 This has arisen because, although there will be creation of habitats, the area of habitat creation is inadequate to compensate for the scale of habitat loss.

12.413 The development will cause an overall loss of habitats, with the loss of pasture grassland being the single most dominant habitat loss incurred.

12.414 There will be creation of some species-rich grassland habitat, but it is considered that the small 6.57ha area of created grassland will not adequately compensate for the large scale loss of semi-improved grassland in terms of overall biodiversity value.

12.415 Therefore the Landscape Plan gives rise to total greenspace which, despite adding a small net amount of valuable scrub habitat, involves the net loss habitats across The Site. Such an overall habitat loss will give rise to a permanent negative impact upon species associated with grassland.

12.416 It is considered that there will be a moderate overall residual negative impact on biodiversity through loss of habitat within the zone of influence.

12.417 Given the fact that a loss of biodiversity will be inherent during the working life of the scheme, and net compensation will not be achieved to off-set the biodiversity loss associated with habitat destruction incurred in the construction phase, in the long term, the Masterplan does not meet the requirement to ensure 'no net loss of biodiversity'. This therefore conflicts with NPPF hierarchy to avoid, mitigate or compensate impacts upon biodiversity. The implementation in full of the proposed mitigation is considered to result in the residual impact being assessed as minor adverse at the Parish level, but this is significant in relation to policy.

12.418 To ensure no net loss of biodiversity, additional off-site land management proposals need to deliver in the long-term which will ensure compensation is delivered adequately.

Summary

12.419 A data search and a range of ecological surveys have been undertaken to assess the impacts of the proposed Site development on ecology and nature conservation.

12.420 No statutory designated sites would be directly affected by the proposed development. Cuerden Valley Park & River Lostock Biological Heritage Site and potentially also Preston Junction Local Nature Reserve would potentially be indirectly affected through increases in visitor pressure disturbance. No mitigation or compensatory measures to prevent these impacts or deliver additional habitat management is proposed, but appropriate provision of beneficial management to these neighbouring sites will ensure no residual impacts. This mitigation should be secured through way of an appropriate planning condition.

12.421 Potentially adverse impacts of the proposed development, such as dust, noise and hydrological impacts were identified, but with embedded mitigation taken into account these were assessed to be not significant. These should be implemented by way of a CEMP that would be secured by a Planning Condition.

12.422 Loss of all standing water across the site will arise as a result of the development. These losses are effectively compensated for by the creation of ponds and drainage swales throughout the scheme with associated wetland wildflower planting. Appropriate construction practices governed by a CEMP would reduce the potential for indirect impacts to watercourses, standing water, and aquatic species that use the watercourses.

12.423 In terms of area (hectares), there would be a permanent loss of terrestrial habitat in the form of grassland as a result of the proposed development. There would also be temporary loss of ponds, stream, hedgerow and scattered trees grassland during construction works. Impacts would generally be mitigated for by the provision of new planting as part of the landscape proposals. These habitats would take time to establish and would have limited value for the first few years. Mature and veteran trees to hedgerows can not be compensated for within normal timeframes and are considered irreplaceable habitat.

12.424 The scheme does include the provision of similar habitat to that lost, including ponds, woodland, hedgerows, standard trees, and grassland. The provision of wildflower areas and shrubs and will partially mitigate the losses. However, although overall habitat creation and landscaping will be built into the scheme it will not fully compensate for the direct loss of this habitat in either quality or area. Therefore a residual overall negative impact upon wider biodiversity will arise as a consequence.

12.425 The loss of all pond habitat will have a short-term impact upon Common Toad, that has known resting and breeding sites within the Site. Three Common Toad breeding ponds will be lost but these impacts will be effectively mitigated and compensated for through a series of new pond creation and works which should be secured by way of a Planning Condition.

12.426 With the implementation in full of the proposed mitigation, the impacts on Common Toads are considered to be not significant and will ensure that the species maintains its favourable conservation status in the long term.

12.427 The level of bat activity at the site is low and unremarkable in the local Lancashire context. The main areas of bat foraging and commuting activity along Stoney Lane and School Lane will be retained within the development. No known roosts were present within the site although Potential Roost Features were present in a handful of scattered trees. Many of these scattered trees will be felled as a result of the proposal. The development and landscaping of the Site will result in new woodland, pond and hedgerow creation that will support existing populations of bats, including the provision of new bat roosting opportunities.

12.428 Bat mitigation and compensatory habitat provision is considered to be a neutral long-term effect. Mitigation and compensatory habitat creation through the provision of new woodland planting, dark habitat corridors through the site and the provision of bat roosting boxes, will ensure no significant residual risk and these measures should be secured by way of a planning condition.

12.429 On the site a good range of breeding bird species were encountered which were representative, but not unusual, for the local area. These were associated with the hedgerow and woodland habitats. Large areas of semi-improved pasture provide foraging habitats across the site.

12.430 Direct impacts upon nesting birds during the construction phase will be avoided by appropriate timing of vegetation removal or through the use of an ecological clerk of works. These measures should be secured by way of a Planning Condition.

12.431 Bird mitigation and compensatory habitat provision through the provision of new woodland planting, scrub, grassland and hedges and the provision of bird nesting boxes is provided. Hedgerow and woodland losses will be compensated but overall there will be a large loss of grassland habitat and is not fully compensated in quality or area. This is an overall negative residual impact.

12.432 Due to the time lag prior to the start of construction for later phases of this hybrid planning application further preconstruction surveys for all species will be required up to 1 year prior to construction start. These should be secured by way of a Planning Condition.

12.433 Faunal species groups will be significantly affected during construction; however these impacts can largely be mitigated effectively and are short term. Given the scale of the impacts and the scheme it will therefore be important that monitoring of the key fauna groups should be implemented. Monitoring for a period of 5 years should be delivered through a planning condition in order to measure the success of the proposed mitigation and compensatory measures. As can be seen from Table 8.26, the majority of impacts can be addressed via successful delivery of the avoidance, mitigation or compensatory hierarchy. However, there remains an overall significant residual impacts at the Site.

Table 12.21: Summary of the Ecological Impact Assessment

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/ Minor) (Beneficial/Adverse/ Negligible)
				I	UK	E	R	C	B	L	
Construction											
Priority hedgerow habitat impact at the Parish level	Loss of hedgerow	Significant -ve	Retention of all 'Important' hedgerows No net loss of linear meterage Loss of mature and veteran trees within hedgerows cannot be compensated for						X		Significant negative impact at Borough level.
Priority Pond habitat	Loss of Three priority ponds	Significant -ve	Creation of ponds						X		Slight positive. Not significant.
Species poor semi improved grassland outside Lancashire Grassland Network	Loss of grassland	Significant -ve	Species rich grassland creation							X	Significant negative impact at Site level.
Species poor semi improved grassland inside Lancashire Grassland Network	Loss of grassland	Significant -ve	Species rich grassland creation						X		Significant negative impact at Borough level.
Common Toad	Killing, injury or destruction and destruction of 100% of aquatic and terrestrial habitat (3 ponds)	Significant –ve	Creation of ponds. Works undertaken in accordance with a detailed method. Timing constraints.						X		Not significant

Bats	Loss of linear and pond habitat features used for foraging and commuting resulting in habitat severance for small numbers of bats. Loss of PRFs from mature broadleaved trees (no confirmed roosts) and lighting impacts on remaining flight lines.	Significant -ve	Significant linear commuting features are the tree/hedge lines along Stoney Lane and Old School lane which are to be retained. No confirmed roosts present but pre-commencement surveys and Ecological Clerk of Works to oversee soft felling of trees. New habitat creation and sensitive lighting to prevent habitat severance and bat boxes installed. Bat sensitive location-specific lighting design avoiding spill onto flight lines, foraging habitat, commuting features						X		Not significant
Breeding birds	Killing, injury or destruction of nests, eggs and young during construction. Loss of grassland, ponds, hedgerow and woodland Habitat used for foraging and nesting.	Significant -ve	Timing of works to avoid breeding season. Provision of nest boxes during construction and operation. Partial replacement of breeding habitat.							X	negative impact. Significant.
Completed Development											
Cuerden Valley Park & River Lostock BHS	Disturbance	Significant –ve impact	Provision of financial contribution to enable managers to implement long-term sensitive habitat protection measures					X			Slight positive. Not significant.
Cumulative Effects											
Construction											
Restoration of Lydiate Quarry Lydiate Lane	Temporary	Neutral	Work adjacent site unlikely to have negative or positive impacts on site								Not significant
Operation											
Restoration of Lydiate Quarry Lydiate Lane	Permanent	Slight positive. Not significant.	Work adjacent site likely to have a positive impact on site but only at a local level								Slight positive. Not significant.

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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