

Appendix 1

Illustrative Masterplan

Appendix 2
Biodiversity Checklist

BIODIVERSITY CHECKLIST

Please complete this form having regard to the Biodiversity Checklist Notes, which can be found at:
<http://www.arun.gov.uk/biodiversity-checklist>

If you tick Yes, you must provide supporting information/statement with the application. If you do not the application will be held as invalid until you do so.

Site Address/Application Reference Number:

LAND EAST OF THE LANE, WALBERTON,
WEST SUSSEX

Bats

YES

NO

Has the site been surveyed for bats?

☐
☒

Are there any structures on site which have the potential to support roosting bats?

☒
☐

Structures with high potential include all agricultural buildings, buildings with weather boarding, tunnels, mines, ice houses, bridges, cliff faces with crevices and woodland. Further guidance can be found in 'Bat Surveys: Good Practice Guidelines' available from www.bats.org.uk and the Bat Mitigation Guidelines available from:

<http://www.naturalengland.org.uk/ourwork/regulation/wildlife/species/bats.aspx>

Are there any trees on the site which have the potential to support roosting bats?*

☒
☐

Trees with high potential to support roosting bats include old and veteran trees and any tree with cracks or crevices. Where appropriate, foraging and commuting routes should be incorporated into the design of the scheme. Further guidance can be found in 'Bat Surveys: Good Practice Guidelines'

Barn Owls

YES

NO

Has the site been surveyed for barn owls?*

☐
☒

Is there any evidence of barn owls nesting on or near the site or are there suitable nesting areas on the development site?*

☐
☒

Barn owls often nest in farm buildings, dovecotes, bale stacks, hollow trees and a wide variety of derelict buildings. Barn owls require habitat which supports high number of small mammals including pasture, hedgerows and woodland. Further information can be found at <https://www.gov.uk/guidance/construction-near-protected-areas-and-wildlife>

Breeding birds

YES

NO

Has the site been surveyed for breeding birds?*

☒
☐

Will areas of hedgerow/scrub/woodland/trees or other features likely to be used by nesting birds be affected by the proposal?*

☒
☐

If 'Yes' then mitigation measures to ensure occupied nests are protected should be included with the application.

Badgers

YES

NO

Has the site been surveyed for badgers?*

☒
☐

Is there any evidence of badgers on or near the application site?*

☐
☒

Are badgers commuting through the site to foraging areas?*

☐
☒

Badgers use a wide variety of habitats and setts can be found in hedgerows, woodlands, scrub and field margins. Where appropriate, safe routes to foraging areas should be incorporated into the development proposals. Further information can be found in 'Badgers and Development' available at:

<http://www.naturalengland.org.uk/ourwork/regulation/wildlife/species/badgers.aspx>

Updated 11/05/16

	YES	NO
<i>Dormice</i>		
Has the site been surveyed for dormice?*	☐	☒
Is there suitable habitat for dormice on, or close to the application site?*	☒	☐

Dormice are found in a variety of habitats including ancient semi-natural woodland, scrub, young plantations (both broadleaved and coniferous) and hedgerows. Occasionally they are recorded in gorse scrub, heathland and alder trees in reedbeds.

<https://www.gov.uk/guidance/hazel-dormice-protection-surveys-and-licences>

	YES	NO
<i>Great crested newts</i>		
Has the site been surveyed for great crested newts?*	☒	☐
Is there suitable habitat for great crested newts on, or close to the application site?*	☒	☐

Great crested newts are often recorded in ponds, reedbeds, ditches and mineral workings. Terrestrial habitat used by newts is varied and includes semi-natural grassland, woodland, hedgerows and pasture and are often found in urban sites including gardens. Further guidance on great crested newts can be found in the Great Crested Newt Mitigation Guidelines from:

<https://www.gov.uk/guidance/great-crested-newts-protection-surveys-and-licences>

	YES	NO
<i>Reptiles</i>		
Has the site been surveyed for reptiles?*	☐	☒
Is there suitable habitat on the site for reptiles?*	☒	☐

Reptiles use a variety of habitats including rough grassland, heathland, allotments, scrub, brownfield sites, field margins and abandoned gardens. Further information can be found at:

<https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences>

Appendix 3

Methodology

EVALUATION METHODOLOGY

The Ecological Assessment has been completed following guidance in the Chartered Institute of Ecology and Environmental Management (CIEEM) *Guidelines for the Ecological Impact Assessment in the United Kingdom* (2016).

Using the above guidance and professional judgement, the important ecological features assessed in this report are valued according to the EclA guidelines (CIEEM, 2016) on a geographical frame of reference, at either within the Zone of Influence, Parish/Local, District, County, Regional, National, European or International level of importance.

The study area encompassed the Zone of Influence of the proposal. The Zone of Influence is defined as *“the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities”* (CIEEM, 2016).

DESK STUDY METHODOLOGY

A desk study was carried out to gather and refer to existing biodiversity and contextual information with respect to the Zone of Influence and the wider area. This involved interrogation of internet resources, including the Multi-agency Geographic Information for the Countryside (MAGIC), aerial photos, current Ordnance Survey maps and the Old Maps online database. Reference was also made to local planning policies, strategies and initiatives relating to biodiversity.

Sussex Biodiversity Records Centre was commissioned to provide information from their database to provide existing data records with full coverage of the site. Statutory site designations for nature conservation were identified within 5km and non-statutory sites, protected species records and all other records were identified within a 2km radius from the centre of the site.

FIELDWORK METHODOLOGY

Preliminary Ecological Appraisal

The field survey was completed by Daniel O’Sullivan of EPR on 6 March 2017. The entire site and immediate surrounds (where access was permitted) was walked, recording habitats and features of potential value to wildlife and any evidence of, or potential for, protected or notable species or habitats, in accordance with the methods described below.

Land Use, Habitat Types, Vegetation Communities and Flora

Within the study area the land use, habitat types and landscape features (such as hedgerows and veteran trees) were described and mapped. For each main habitat type the dominant vegetation communities were recorded, along with any notable or indicator plant species, (including Japanese Knotweed where present). A preliminary evaluation of the structure, quality and likely management of each habitat or feature was also carried out.

The survey method used to record this information was based on Phase 1 Habitat Survey methodology (JNCC 2010).

Badgers

Consideration was given to the presence of habitat potentially suitable for supporting Badgers, including woodland and grassland. Potential evidence of the presence of Badgers was looked out for and noted, including earthworks that might be Badger setts, and signs such as dung pits, mammal pathways through ground vegetation and under fences, and hairs on fences.

Bats

Bats use buildings and trees for roosting and breeding and, where present, a preliminary assessment of the potential for these features to support bats was undertaken during the survey in accordance with categories set out within the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines (2016). A summary of the methodology used to assess bat roosting potential is given below. Potential may include gaps beneath roof or hanging tiles, in soffits, or beneath the end of ridge tiles, but also under the edge of felt on flat roofs. In trees, potential roosting features include woodpecker holes, splits in branches and peeling bark.

Preliminary evidence was obtained through noting any staining around potential roost entrances, and looking for bat droppings, for example on window sills. A preliminary evaluation was also undertaken of potential bat foraging habitat in the area, including woodland, pasture, hedges and watercourses.

Dormouse

The type and quality of habitat with the potential to be suitable for supporting Dormice, such as woodland and hedgerows, was considered during the survey. In particular, the presence of Oak, Hazel and berry-bearing shrubs was noted, and the connectivity of habitat recorded.

Water Voles

The presence and quality of any watercourses with the potential to support Water Voles was recorded during the survey. Potential evidence of Water Voles, including burrows in the tops and vertical face of riverbanks, and feeding evidence was recorded where appropriate.

Otter

Where watercourses are present, a preliminary evaluation of the quality of the riparian habitat for potentially supporting Otters was made. A preliminary search was made for signs of Otters, including spraints which are often left in prominent places on river banks, such as logs and bare patches of ground.

Birds

Any birds seen whilst carrying out the survey were recorded, and the type and quality of habitats available for birds was considered, including vegetation suitable for nesting, and habitat with the potential to support valued species, including breeding and wintering birds.

Amphibians

Consideration was given to the presence of habitat potentially suitable for supporting amphibians, including water bodies (ponds, ditches), woodland, scrub and rough grassland, and features such as log piles that might provide hibernation areas. Where appropriate, effort to gather direct evidence of amphibians was undertaken by making a preliminary search for eggs by examining vegetation within reach of the margins of water bodies, and for resting animals on land by looking under potential refuges, such as stones, wood and rubbish near to water bodies.

Reptiles

The presence and quality of habitat considered potentially suitable for supporting reptiles was recorded. This included areas providing basking and foraging areas, hibernation and breeding sites, such as rough grassland and scrub, banks, burrows, rubble piles, compost heaps, hedgebanks and water bodies.

Invertebrates

Readily identifiable invertebrates seen during the survey were recorded, and habitats and features likely to support noteworthy groups and species were noted, for example herb-rich grasslands, areas of bare ground and deadwood habitats, including woodland and veteran trees.

Phase 2 Surveys

Grassland Survey

Field Survey

The grassland field within the north-east of the Site was subjected to a more detailed botanical survey to determine whether it support a Priority Habitat. Representative areas were selected at random across the field with plants recorded in a 2x2m quadrat.

Birds

Potential Zone of Influence

Some of the biophysical changes that could potentially affect birds, such as disturbance, have effects beyond the immediate construction footprint, whilst others are likely to affect bird populations through habitat changes. With this in mind, the potential Zone of Influence that has been considered within this assessment is the Site and immediate surrounding area.

Evaluation Methodology

The method for describing the importance of areas for birds is based on that developed by Fuller, 1980 & 1982, which is the standard evaluation method that can be applied to Ecological Impact Assessment. The objective is to establish the relative importance of bird populations within a geographical context which accords with the CIEEM levels of conservation importance set out above.

The three principal attributes of bird communities that are considered are population size, diversity and rarity as outlined below, as well as the presence of any conservation priority species.

Population Size

This is evaluated by assessing the percentage of a population size unit (e.g. national, county) that occurs within the study site. The standard criterion upon which evaluation of population is based is that if 1% or more of the defined geographical unit of a species regularly uses a site, then the site is important at that geographical scale. This means, for example, that if 1% of the national population occurs, then the site is nationally important for that species. Sources of population data include Musgrove *et al.* (2013) at the UK level, and recent county bird reports.

Diversity

The number of species recorded in an area (species richness) is a simple and effective measure of diversity, which can be used in the assessment of a breeding bird assemblage. **Table 1** below shows the thresholds commonly used to measure diversity (Fuller, 1980).

Table 1: Breeding bird assessment using the number of breeding bird species

Level of Importance	Number of Breeding species	
	Fuller (1980)	Adapted criteria
Local	25-49 species	<25
District	-	25-49
County	50-69	50-60
Regional	70-84	70-84
National	85+	85+

For the purposes of this assessment, Fuller's geographical levels have been adapted, so that Fuller's 'Local' importance is assumed to correspond to 'District' importance as described in the CIEEM guidelines (CIEEM, 2016). An assemblage comprising fewer than 25 breeding species is therefore considered to be of Local importance or less.

Since the publication of the criteria in 1980, species diversity has declined significantly, and it is considered that Fuller's thresholds are too high for today's breeding bird populations. For this reason, it is therefore judged appropriate to recalibrate the categories slightly downward.

Rarity

Several measures of rarity can be used. Species with fewer than 1,000 breeding pairs in Britain are described as Nationally Rare (Fuller, 1980). A species with a County population of up to 25 pairs might therefore be treated as being rare in the County (depending on the species and its status).

Rarity can also be recorded by distribution rather than population size. The Breeding Bird Atlas (Balmer *et al.* 2013) records breeding distributions of birds in Britain and Ireland by 10x10 km grid squares. This makes it possible to describe the frequency of occurrence of individual species in terms of the proportions of squares in which they occur. A 30% level forms a useful line below which species can be described as 'Scarce', for both breeding and wintering species.

The occurrence of species which are specially protected by law or otherwise listed as threatened, although not necessarily strictly rare, can also be helpful in establishing the conservation value of sites. Species listed on Schedule 1 of the Wildlife and Countryside Act 1981 or on Annex 1 of the Birds Directive are worthy of special consideration. These lists take into account measures such as population size and distribution.

Conservation Priority Species

A number of bird species are also listed as Species of Principal Importance for Conservation under Section 41 of the NERC Act 2006 (formerly referred to as UK BAP Priority Species) or as Red/Amber-listed Birds of Conservation Concern. Although not taken into account in Fuller's criteria, these species are considered to be particularly vulnerable due to factors such as serious

population declines or reductions in their natural range, and are therefore also given special consideration when assessing the conservation value of breeding bird assemblages.

Breeding Bird Survey Methodology

Four breeding bird survey visits were undertaken within the Zone of Influence by EPR ornithologists Daniel O'Sullivan and Katie Cammack between April and May 2017. The survey was based on the Common Birds Census (CBC) methodology, which is a territory mapping technique used to survey widespread breeding birds in the UK (based on methodology by Marchant, 1983, Gilbert et al. 1998 and Bibby et al. 2000). The aim of this method is to gather sufficient information on the location and activity of birds, in order to identify the likely territories of breeding bird species within the survey area. All birds seen or heard during each visit were recorded on large-scale maps using standard codes denoting species and behaviour.

The CBC usually recommends ten visits over the breeding season, however useful results can be achieved after three or four visits. Fewer visits are justified as birds recorded during the survey period (the core bird breeding season) are those that are likely to be breeding, with different levels of evidence enabling breeding to be classed as Proven, Probable or Possible.

Surveyors walked through the Zone of Influence at a slow pace during suitable weather conditions (principally in the absence of strong wind and persistent rain), to enable all birds to be identified and located. All birds seen or heard were recorded on large-scale maps using standard codes to denote species and behaviour. Routes were varied during each survey visit so that different parts of the Zone of Influence were surveyed at different times of the day.

Analysis of Field Data

The results of the four surveys were amalgamated and analysed according to the methods detailed in Gilbert et al. (1998) to identify clusters of two or more registrations for each bird species, indicating likely territories within the Zone of Influence. Map registrations were carefully analysed to avoid misinterpretation as the presence of some species may be misleading. For example, some migrants are only likely to be passing through on passage (especially during the early season surveys), or passing over or foraging rather than nesting within the Zone of Influence (e.g. Swallow).

Bats

Potential Zone of Influence

Due to the wide-ranging nature of bats, the Zone of Influence for bats is likely to extend beyond the ownership boundary (to include the Site) and into adjacent areas to encompass any populations of bats that use affected habitats on site, although biophysical effects caused by the proposals themselves (e.g. noise, light, land clearance etc.) will be more spatially limited.

Ground Level Tree Survey

A physical survey of trees within the Site and its immediate surrounds was completed on 12 April 2017 by Daniel O'Sullivan of EPR. The survey focussed on those trees where potential for significant negative effects from the Site were identified, with a more general walkover survey conducted within the remainder of the Site to highlight any trees of particular note with relation to their potential to support bats. The surveys comprised a search from ground level, with the assistance of binoculars, for features with the potential to support bats, including woodpecker holes, loose bark, cracks and crevices, broken off limbs and dense ivy, as well as signs of bats, such as scratching and staining.

Based on the features recorded, trees were identified as having either high, medium or low value as follows:

- **Low** - limited potential/suitability for small numbers of bats - probably will not be used by bats;
- **Medium** - offering potential roosting sites for small numbers of bats - could be used but not optimum roosting sites;
- **High** - high potential offering types of roosting sites known to be used by bats and/or suitable for numbers of bats.

Amphibians

Potential Zone of Influence

From viewing maps and aerial photographs water bodies were identified to be present within 500m of the Site boundary. It is generally considered that Great Crested Newts will use terrestrial habitat within 250m and potentially up to 500m from a breeding pond (English Nature (now Natural England), 2001). Therefore, Great Crested Newts in any pond within 500m of the Site and not isolated by barriers to movement could be affected by a proposed development in the absence of mitigation. However, considering the limited area of existing suitable terrestrial habitat on site and that there is suitable terrestrial habitat present within the vicinity of those identified water bodies, only water bodies within 250m of the Site boundary that are not separated by significant barriers to dispersal require further consideration (Natural England, 2015). Surveys at a distance greater than 250m are considered to be only necessary when all of the following conditions are met (Natural England, 2015):

- Maps, aerial photos, walk over surveys or other data indicate that the pond(s) has potential to support a large GCN population;
- The footprint has particularly favourable habitat for GCN;
- The development would have a substantial negative effect on that habitat; and
- There is an absence of dispersal barriers.

A number of water bodies are located in close proximity to the Site, approximately 30m to the north within the adjacent golf course. While the Site contains mostly suboptimal habitat with limited cover there is suitable terrestrial habitat on the Site where the woodland is present that offers potential cover for dispersing and foraging Great Crested Newt. It is also possible that Great Crested Newt may cross the arable field under suitable weather conditions to reach more suitable habitat. Given the nature of the development, associated activities, the ecology and requirements of Great Crested Newt, the Zone of Influence is considered to extend outside the Site to include all suitable Great Crested Newt ponds and terrestrial habitat within 250m of the Site boundary. A total of five ponds were identified within 250m of the Site boundary in the absence of dispersal barriers with no ponds being present inside the Site boundary itself.

Habitat Suitability Index Survey

All ponds situated within the Zone of Influence and that were accessible were initially checked during a daytime visit and assessed to establish their current suitability for supporting Great Crested Newts. This was achieved by completing a Habitat Suitability Index (HSI) survey of the five ponds identified within 250m of the Site boundary (Oldham et al, 2001). The HSI is a scoring

system that produces a value against 10 suitability indices, for example 'Water Quality' and 'Pond Drying'. The total score of the 10 index values indicates whether a pond would be subjected to further presence/likely absence pond surveys. In general, waterbodies scoring an "average" HSI score or above should undergo further presence/likely absence Great Crested Newt surveys. Ponds rated as "below average" or "poor" using the HSI are considered unlikely to support Great Crested Newt (see **Table 2**). Equally, those waterbodies with poor connections to surrounding habitat and without suitable foraging habitat/shelter are unlikely to yield populations. However, this is not a definitive guide and professional opinion can override the decision.

Table 2: Categorisation of Habitat Suitability Index Scores

HSI Score	Pond Suitability
<0.5	Poor
0.5-0.59	Below average
0.6-0.69	Average
0.7-0.79	Good
>0.8	Excellent

Pond Survey (Presence/Likely Absence GCN Surveys / Population Size Class Assessment)

Great Crested Newt survey methodology followed the Great Crested Newt Mitigation Guidelines (English Nature, 2001). The Guidelines suggest a minimum of four visits is required to determine the presence or likely absence of Great Crested Newt within a water body and a minimum of six visits is required to enable an estimate of the population class size to be made. At least two of the visits should take place between mid-March and mid-May (or three visits should Great Crested Newt be recorded as present), which is the peak breeding season for Great Crested Newt.

Each pond within the Zone of Influence that required presence/likely absence surveys was visited either four or six times, depending on whether Great Crested Newt had been recorded within the four initial visits or known historically to have used the pond.

These pond surveys employed four different survey techniques, which were heavily dependent on the characteristics of each water body. The methods considered to be most appropriate for the Site were bottle-trapping, torchlight searching, netting, and egg searches. A minimum of two different survey techniques was used at each pond at each visit. A brief explanation of the methods used is given below:

- **Torchlight searching** - The water's edge of the pond was scanned at night using a powerful halogen lamp with at least 500,000 candlelight power. All water was searched systematically and repeatedly. It is possible through torching for experienced surveyors to distinguish newt species and sex from external patterning. Torch survey was only undertaken during nights with suitable weather conditions for good activity: night-time air temperature more than 5°C, with no or little rain.
- **Egg searching** - Examination of submerged vegetation for eggs was carried out where practical since this is an effective method for detecting the presence of breeding Great Crested Newt. Great Crested Newt eggs are characteristic in size and colour, laid singly and folded within pliable material such as the leaves of aquatic plants and plastic debris. This can be an effective way of establishing presence of Great Crested Newt in a pond,

even at low populations. Artificial 'egg strips' were deployed in Ponds 8, 10, 11 and 15 as the ponds were poorly vegetated. These were constructed following the Great Crested Newt Guidelines, cutting plastic bin liners cut into 1-2cm wide strips, attaching them to a wooden stake and submerging them near the pond margin. These were then checked as per the natural egg searching procedure.

- **Netting** - A long-handled dip-net was carefully used to sample heavily vegetated areas of ponds at night following torch survey. Results from netting are normally only useful for indicating presence and the technique is usually less effective than the aforementioned techniques.
- **Bottle-trapping** - Bottle-traps are made from 2 litre soft drinks bottles that have had the top cut off and inverted. The traps are then placed at an angle into the pond and held in place by means of a bamboo cane. Bottle traps were placed around the pond margin approximately one trap per two metres of shoreline or at a higher density where possible. The bottle traps are left set overnight and visited again the following morning. Surveying was only undertaken in ideal weather conditions (night-time air temperature more than 5°C), and care was taken to check the traps early prior to the temperature getting too high, this ensured that no newts were harmed during the surveys.

Population Size Class Assessment Methodology

Using maximum counts (the total of adult newts seen within all ponds within a population in a single night) any population(s) found present were assigned a size class as defined by the Great Crested Newt Mitigation Guidelines (English Nature, 2001).

Appendix 4

Grassland Survey

The botanical survey of the grassland field within the north-east of the Site was conducted by Karen Colebourn of EPR on 5 April 2017, in fine and cool weather. The results are provided in **Table 3**.

Table 3: Species List Results of the Grassland Survey

Plants Recorded from the Whole Grassland Field (SU 976 062)		
Species	English Name	Estimated abundance (Dominant; Abundant; Frequent; Occasional; Rare)
<i>Achillea millefolium</i>	Yarrow	F
<i>Bellis perennis</i>	Daisy	R (locally F)
<i>Lolium spp</i>	Ryegrass	D
<i>Plantago lanceolata</i>	Ribwort plantain	R
<i>Poa annua</i>	Annual Meadow-grass	O
<i>Ranunculus ficaria</i>	Lesser celandine	R
<i>Ranunculus repens</i>	Creeping buttercup	O
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O
<i>Taraxacum officinale</i>	Dandelion	O
<i>Trifolium spp</i>	Clover	O
<i>Veronica chamaedrys</i>	Germander speedwell	F
Plants recorded from Representative 2x2m Quadrat (SU 97633 06263)		
		Cover (Domin scale)
<i>Achillea millefolium</i>	Yarrow	4
<i>Poa annua</i>	Annual Meadow-grass	1
<i>Lolium spp</i>	Ryegrass	10
<i>Taraxacum officinale</i>	Dandelion	1
<i>Veronica chamaedrys</i>	Germander speedwell	3

Appendix 5

Bird Survey

Dates and weather conditions for each of the four breeding bird surveys conducted are given in **Table 4** below.

Table 4: Breeding Bird Survey visits

Date	Start/Finish Times	Sunrise Time	Weather Conditions
13 April 2017	07.10 – 8.50	06.10	Dry, cloud 80%, light wind, 8°C
27 April 2017	06.44 – 08.30	06.44	Dry, cloud 10%, light wind, 2-7°C
8 May 2017	06.30 – 7.40	05.25	Dry, cloud 75%, light wind, 7.5°C
15 May 2017	06.15 – 07.15	06.13	Dry with light rain towards end of survey, cloud 100%, light wind, 11-12°C

Table 5 below lists all of the bird species recorded within the Zone of Influence during the four breeding bird surveys.

Table 5: Species recorded during 2017 breeding bird surveys

Name	Scientific Name	Breeding status	Notes
Swallow	<i>Hirundo rustica</i>	N	Seen flying over the Site
Green Woodpecker	<i>Picus viridis</i>	Pr	
Great Spotted Woodpecker	<i>Dendrocopos major</i>	Po	
Pheasant	<i>Phasianus colchicus</i>	N	
Pied Wagtail	<i>Motacilla alba</i>	N	
Moorhen	<i>Gallinula chloropus</i>	N	Seen in ponds on adjacent golf course
Woodpigeon	<i>Columba palumbus</i>	Pr	
Magpie	<i>Pica pica</i>	Pr	
Jackdaw	<i>Corvus monedula</i>	Po	
Carrion Crow	<i>Corvus corone</i>	Po	
Goldcrest	<i>Regulus regulus</i>	Pr	
Blue Tit	<i>Cyanistes caeruleus</i>	B	
Great Tit	<i>Parus major</i>	Pr	
Chiffchaff	<i>Phylloscopus collybita</i>	Pr	
Blackcap	<i>Sylvia atricapilla</i>	Pr	
Wren	<i>Troglodytes troglodytes</i>	Pr	

Name	Scientific Name	Breeding status	Notes
Starling*	<i>Sturnus vulgaris</i>	N	Seen feeding in low numbers in the grassland field within the north-east of the Site, likely to be nesting in buildings offsite
Blackbird	<i>Turdus merula</i>	B	
Robin	<i>Erithacus rubecula</i>	B	
Dunnock*	<i>Prunella modularis</i>	Pr	Between 4 and 6 pairs thought to be nesting across the Site
Mallard	<i>Anas platyrhynchos</i>	N	Seen flying over the Site
Kestrel	<i>Falco tinnunculus</i>	N	Seen flying over the Site
House Sparrow*	<i>Passer domesticus</i>	N	Seen in boundary vegetation close to houses, likely to be nesting in buildings offsite
Chaffinch	<i>Fringilla coelebs</i>	Pr	
Linnet*	<i>Carduelis cannabina</i>	N	Small group of 2 or 3 individuals, including singing male seen on adjacent golf course
Goldfinch	<i>Carduelis carduelis</i>	Pr	
Long-tailed Tit	<i>Aegithalos caudatus</i>	Po	

Key

B	Breeding confirmed (nest or young seen)
Pr	Breeding probable (holding territory, e.g. singing male)
Po	Breeding possible (present during breeding season in suitable habitat)
O	Observed during breeding season, but no evidence of breeding (i.e. raptors flying over, herons with no evidence of heronry, ducks summering on an urban pond)
N	Not breeding: wintering, transients or passage
*	Listed under Section 41 of the NERC Act 2006
	Red-listed Bird of Conservation Concern
	Amber-listed Bird of Conservation Concern

Appendix 6

Bat Tree Inspection Survey

Table 6 below provides the results of the ground level bat tree inspection survey of those trees identified as having bat roosting potential.

Table 6: Ground Level Tree Inspection Results

New Tree ID	Species	Common Name	Approx. Height (m)	Roost Feature Description	Description	Bat Roost Potential
1	<i>Quercus robur</i>	Pedunculate Oak	5	Ivy	Dense ivy on south face of tree; south aspect	Low
2	<i>Quercus robur</i>	Pedunculate Oak	35	Flaking/lifted bark and dead wood	Flaking bark and dead wood on one limb; south aspect; 12m high	Low
3	<i>Quercus robur</i>	Pedunculate Oak	35	Flaking/lifted bark	Flaking bark on limb; south aspect; 14m high	Low
4	<i>Populus nigra</i>	Lombardy Poplar	30	Ivy	Dense Ivy covering whole tree trunk	Low
5	<i>Populus x canescens</i>	Grey Poplar	30	Ivy	Dense Ivy covering whole tree trunk	Low
6	<i>Crataegus monogyna</i>	Hawthorn	12	Ivy	Dead Ivy covering whole tree and main trunk dying	Low
7	<i>Populus nigra</i>	Lombardy Poplar	30	Ivy	Dense Ivy covering whole tree	Low
8	<i>Populus nigra</i>	Lombardy Poplar	30	Ivy	Dense Ivy covering whole tree	Low
9	<i>Populus nigra</i>	Lombardy Poplar	30	Ivy	Dense Ivy covering whole tree	Low
10	<i>Populus x canescens</i>	Grey Poplar	30	Rot hole	Rot hole from where limb has broken off (does not appear to go far); north aspect 25m high	Low
11	<i>Quercus robur</i>	Pedunculate Oak	30	Flaking/lifted bark	Lifted bark on limb; south aspect; 10m high	Low

12	<i>Prunus lusitanica</i>	Portugal Laurel	20	Rot hole and Woodpecker hole	Woodpecker hole (does not appear to go anywhere, and same for rot hole); east aspect; 8m high	Low
13	<i>Populus nigra</i>	Lombardy Poplar	30	Woodpecker hole	Woodpecker holes that are in current use by Green Woodpecker; north aspect; 25m high	Low

Appendix 7

Great Crested Newt Survey

Habitat Suitability Index Assessment

The Great Crested Newt Habitat Suitability Index (HSI) score was calculated for each pond, based on Oldham et al. (2001). The results of these calculations are summarised in **Table 7** and more detailed results are provided further below.

The results of the HSI (along with professional judgement) indicated that all five ponds should be subjected to a presence/likely absence pond survey due to their proximity to each other and that they are connected via a ditch system.

Table 7: Summary of Habitat Suitability Index Scores

Pond	HSI score	Pond suitability	Subject to further survey
1	0.39	Poor	Yes
2	0.56	Below Average	Yes
3	0.58	Below Average	Yes
4	0.59	Below Average	Yes
5	0.70	Good	Yes

Pond Survey Results (Presence/Likely Absence GCN Surveys / Population Size Class Assessment)

The results of the presence/likely absence pond surveys are summarised in **Table 8** and more detailed results are also provided further below.

Table 8: Summary of GCN Presence/Likely Absence Survey Results

Pond	No. of visits	Visit Number				Great Crested Newt eggs	Smooth Newt	Palmate Newt	Common Frog	Common toad
		Maximum Great Crest Newt Adult Count/Visit								
		1	2	3	4					
1	4	0	0	0	0	No	Yes	No	No	No
2	4	0	0	0	0	No	Yes	Yes	No	No
3	4	0	0	0	0	No	Yes	Yes	Yes	No
4	4	0	0	0	0	No	Yes	Yes	No	No
5	4	0	0	0	0	No	Yes	Yes	Yes	No

Detailed Results of the Habitat Suitability Index Survey

Suitability Indices	Pond 1	Pond 2	Pond 3	Pond 4	Pond 5
SI ₁ - Geographical Location	A - Optimal	A - Optimal	A - Optimal	A - Optimal	A - Optimal
SI Score	1	1	1	1	1
SI ₂ - Pond Area (m ²)	1180m ²	50m ²	96m ²	132m ²	180m ²
SI Score	0.92	0.10	0.19	0.26	0.36
SI ₃ - Pond Drying	Never	Rarely	Rarely	Rarely	Never
SI Score	0.90	1	1	1	0.9
SI ₄ - Water Quality	Poor	Poor	Poor	Poor	Moderate
SI Score	0.33	0.33	0.33	0.33	0.67
SI ₅ - Shade (% at perimeter)	10	20	60	70	15
SI Score	1	1	1	0.80	1
SI ₆ - Fowl	Major	Minor	Minor	Minor	Minor
SI Score	0.01	0.67	0.67	0.67	0.67
SI ₇ - Fish	Minor	Absent	Absent	Absent	Absent
SI Score	0.33	1	1	1	1
SI ₈ - Ponds (Ponds within 1km)	6	8	12	16	15
SI Score	1	1	1	1	1
SI ₉ - Terrestrial Habitat	Poor	Poor	Poor	Poor	Poor
SI Score	0.33	0.33	0.33	0.33	0.33
SI ₁₀ - Macrophytes (% Cover)	0	10	0	5	30
SI Score	0.31	0.41	0.31	0.36	0.61

Habitat Suitability Index HSI Score	0.39	0.56	0.58	0.59	0.70
Pond Suitability	Poor	Below Average	Below Average	Below Average	Good

Detailed Results of the Pond Survey Results (Presence/Likely Absence GCN Surveys / Population Size Class Assessment)

Pond 1

Date	No. of Bottle-traps	Temp. (°C)	Veg. Cover (0=none, 5=complete)	Turbidity (0=none, 5=turbid)	Torch – Number of Newts										Bottle-trap – Number of Newts										Eggs	Immature or Larvae of GCN	Rt or Bb
					GCN			Lv		Lh		Lv/Lh			GCN			Lv		Lh		Lv/Lh					
					M	F	NS	M	F	M	F	M	F	NS	M	F	NS	M	F	M	F	M	F	NS			
26/04/17	0	11.4 - 5	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	0
02/05/17	19	8 - 5	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	0
09/05/17	15	14	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	No	No	0
18/05/17	15	12.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	0

Key: M: Male, F: Female, NS: Unsexed, GCN: Great Crested Newt, Lv: Smooth Newt, Lh: Palmate Newt, Rt: Common Frog, Bb: Common Toad

Methods used: Torching, bottle-trapping, netting, egg search

Pond 2

Date	No. of Bottle-traps	Temp. (°C)	Veg. Cover (0=none, 5=complete)	Turbidity (0=none, 5=turbid)	Torch – Number of Newts										Bottle-trap – Number of Newts										Eggs	Immature or Larvae of GCN	Rt or Bb
					GCN			Lv		Lh		Lv/Lh			GCN			Lv		Lh		Lv/Lh					
					M	F	NS	M	F	M	F	M	F	NS	M	F	NS	M	F	M	F	M	F	NS			
26/04/17	0	5	1	3	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	0
02/05/17	5	11.4 - 5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	No	No	0
09/05/17	5	8 – 5	1	0	0	0	0	2	3	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	No	No	0
18/05/17	5	12.2	1	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	No	No	0

Key: M: Male, F: Female, NS: Unsexed, GCN: Great Crested Newt, Lv: Smooth Newt, Lh: Palmate Newt, Rt: Common Frog, Bb: Common Toad

Methods used: Torching, bottle-trapping, netting, egg search

Pond 3

Date	No. of Bottle-traps	Temp. (°C)	Veg. Cover (0=none, 5=complete)	Turbidity (0=none, 5=turbid)	Torch – Number of Newts										Bottle-trap – Number of Newts										Eggs	Immature or Larvae of GCN	Rt or Bb
					GCN			Lv		Lh		Lv/Lh			GCN			Lv		Lh		Lv/Lh					
					M	F	NS	M	F	M	F	M	F	NS	M	F	NS	M	F	M	F	M	F	NS			
26/04/17	0	5	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	0
02/05/17	5	11.4 - 5	0	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	No	No	0
09/05/17	5	8 - 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	0
18/05/17	5	12.2	0	1	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	No	No	3Rt

Key: M: Male, F: Female, NS: Unsexed, GCN: Great Crested Newt, Lv: Smooth Newt, Lh: Palmate Newt, Rt: Common Frog, Bb: Common Toad

Methods used: Torching, bottle-trapping, netting, egg search

Pond 4

Date	No. of Bottle-traps	Temp. (°C)	Veg. Cover (0=none, 5=complete)	Turbidity (0=none, 5=turbid)	Torch – Number of Newts										Bottle-trap – Number of Newts										Eggs	Immature or Larvae of GCN	Rt or Bb	
					GCN			Lv		Lh		Lv/Lh			GCN			Lv		Lh		Lv/Lh						
					M	F	NS	M	F	M	F	M	F	NS	M	F	NS	M	F	M	F	M	F	NS				
26/04/17	0	5	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	0	
02/05/17	5	11.4 - 5	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	No	No	0
09/05/17	5	8 - 5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	3	0	0	0	0	0	No	No	0	
18/05/17	5	12.2	0	1	0	0	0	2	0	0	0	0	5	0	0	0	0	4	6	0	0	0	0	0	No	No	0	

Key: M: Male, F: Female, NS: Unsexed, GCN: Great Crested Newt, Lv: Smooth Newt, Lh: Palmate Newt, Rt: Common Frog, Bb: Common Toad

Methods used: Torching, bottle-trapping, netting, egg search

Pond 5

Date	No. of Bottle-traps	Temp. (°C)	Veg. Cover (0=none, 5=complete)	Turbidity (0=none, 5=turbid)	Torch – Number of Newts										Bottle-trap – Number of Newts										Eggs	Immature or Larvae of GCN	Rt or Bb
					GCN			Lv		Lh		Lv/Lh			GCN			Lv		Lh		Lv/Lh					
					M	F	NS	M	F	M	F	M	F	NS	M	F	NS	M	F	M	F	M	F	NS			
26/04/17	0	5	30	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	Rt tadpoles
02/05/17	15	11.4 - 5	70	0	0	0	0	3	5	0	0	0	0	0	0	0	0	7	5	0	0	0	0	0	No	No	0
09/05/17	15	8 - 5	60	0	0	0	0	10	7	0	0	0	0	0	0	0	0	5	4	0	0	0	0	0	No	No	0
18/05/17	15	12.2	60	0	0	0	0	0	0	0	0	0	6	0	0	0	0	4	4	0	0	0	0	0	No	No	0

Key: M: Male, F: Female, NS: Unsexed, GCN: Great Crested Newt, Lv: Smooth Newt, Lh: Palmate Newt, Rt: Common Frog, Bb: Common Toad

Methods used: Torching, bottle-trapping, netting, egg search