ECOLOGICAL APPRAISAL REPORT:

Menzies Wood Farm,

Okehurst Lane,

Billingshurst,

West Sussex,

RH14 9HR

For: **Mr M. Betts**

Menzies Wood Farm

Issued by: **Wychwood Environmental Ltd**

www.wychwoodenvironmental.com

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EXECUTIVE SUMMARY

Proposed development

- This application includes the removal of two buildings within a light industrial, to be replaced by more modern buildings for a similar use.

Impacts

- The habitats contained within the areas of the site proposed to be impacted by the works are of low ecological value.
- Parts of the site proposed to be impacted support a high potential to support foraging bats.
- The areas of the site proposed to be impacted support a high potential to support nesting birds during the spring/summer months.
- The areas of the site proposed to be impacted have moderate potential to impact foraging and commuting mammals, such as hedgehogs, foxes [redacted] during the construction phase.

Further recommended surveys

- This site requires no further surveys

Proposed mitigation

- Mitigation to reduce the impacts of artificial lighting upon foraging bats is detailed.
- Mitigation to reduce the impacts to nesting birds is detailed.
- Mitigation to reduce impacts upon commuting and foraging mammals during construction is detailed.
- It is proposed that a Biodiversity and Ecological Mitigation Plan (BEMP) be produced for the site and secured through a planning condition.

Enhancements

- Native species planting is recommended within any proposed landscaping plan for the site.
- It is suggested that additional roosting and nesting opportunities for birds and bats are provided within the development scheme.

Conclusions

- The survey has identified a number of potential ecological constraints but with appropriate mitigation, there will be no residual impacts.

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Verified by: Dr. Craig Turner MSc MCIEEM FRGS FLS

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1.0 INTRODUCTION

1.1 Wychwood Environmental Ltd was instructed to undertake a Preliminary Ecological Assessment to highlight the possible presence of protected species (e.g. bats, [redacted] great crested newts, reptiles, and breeding birds) and/or habitat(s) of ecological/conservation value on the proposed development site at: Menzies Wood Farm, Okehurst Lane, Billingshurst, West Sussex, RH14 9HR.

1.2 Surveys are necessary to collect information on habitats/protected species to provide necessary guidance and mitigation advice, to ensure that no valuable habitats/protected species are adversely affected by the proposed development.

1.3 The survey was completed to inform the Local Planning Authority (LPA) of any material impacts resulting from the proposed development and to ensure compliance with the requirements of the Natural Environment and Rural Communities (NERC) Act (2006) (Section 40) and the Government Circular: Biodiversity and Geological Conservation – Statutory obligations and their impact within the Planning System (ODPM 06/2005, Defra 01/2005). The legislation relating to protected species is detailed in Annex 1.

1.4 Development proposals include the re-configuring of the existing site that currently supports three buildings used for storage and light industry. The proposed development will retain an existing open sided barn within the centre of the site, with the demolition and replacement of the two other existing buildings. The location of the site is shown in Figures 1-4 (Annex 2). The proposed development is detailed in Figure 3 (Annex 2). Full details of the proposed development will also be provided in the planning submission.

1.5 Section two of this report describes the methodologies used for survey work. Section three provides the results of these surveys, sections four and five provide discussion and implications for development, with further surveys and mitigation covered in section six and enhancement recommendations are made in section seven.

2.0 METHODOLOGY

Habitat Survey

2.1 A Preliminary Ecological Assessment (PEA) of the site was undertaken, following standard extended Phase 1 habitat survey protocols (IEA, 1995), by Dr Ryan Walker on 24th June 2024. This involved systematically walking over the site and classifying each parcel of land based on vegetation, into one of approximately 90 habitat types (JNCC, 2010).

2.2 A search for any invasive non-native species, as listed under Schedule 9 of the Wildlife and Countryside Act 1981, as amended,[1] such as Japanese knotweed (*Fallopia japonica*) was also carried out.

2.3 Any habitats or features of interest and any sightings, signs or evidence of protected or notable fauna or any potential habitats suitable for such species, were assessed as detailed below:

- The suitability of habitats was assessed for amphibians (including great crested newts, *Triturus cristatus*)[2];
- [redacted]
- The suitability of the habitats was assessed for dormice (*Muscardinus avellanarius*);
- The suitability of the habitats was assessed for hedgehog (*Erinaceus europaeus*);
- Buildings with features potentially suitable for roosting bats were assessed following best practice guidelines as outlined by the survey techniques published by the Bat Conservation Trust (BCT)[4] and Mitchell-Jones and McLeish (2004) [5]. Trees within the development area were also assessed for their potential to support roosting bats (following BCT protocols).

[1] http://archive.defra.gov.uk/wildlife-pets/wildlife/management/non-native/documents/schedule9-list.pdf
[2] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10(4), 143-155.
[3] Badger survey followed guidelines recommended in Harris *et al*. (1989).
[4] Collins J (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4rd edn) (published by Bat Conservation Trust, London).
[5] Mitchell-Jones A J (2004). *Bat mitigation guidelines.* English Nature.

- Landscape features such as hedgerows, trees and shrubs were also assessed for their potential suitability for bat foraging and commuting.
- The suitability of habitats was assessed for nesting birds.
- The suitability of habitats was assessed for reptiles.

2.4 The site was not assessed for water voles (*Arvicola amphibius*) and otters (*Lutra lutra*) due to its location and the lack of suitable habitat present on site.

2.5 The Internet database MAGIC (Multi-Agency Geographic Information for the Countryside) was searched for any areas with statutory designations within a 2km radius of the site.

Survey Limitations

2.6 An initial site assessment such as this is only able to act like a 'snapshot' to record any flora or fauna that is present at the time of the survey. It is therefore possible that some species may not have been present during the survey but may be evident at other times of the year. For this reason, habitats were assessed for their potential to support some species, even where no direct evidence (such as droppings) has been found.

Baseline Evaluation Criteria

2.7 Based on the desk study and field survey results, an ecological evaluation of the site was undertaken using a combination of evaluation criteria for habitats and species, following the general framework provided by CIEEM[6] (Table 1).

2.8 Where relevant the evaluation was made with reference to the statutory protection afforded to species and habitats. Legal protection does not always correspond to conservation value. Some species (e.g. [redacted] are protected for reasons of animal welfare rather than conservation. Others are of national conservation value but are not protected by law (e.g. some Red Data Book species and UK BAP species).

[6] CIEEM (2017). Guidelines for Preliminary Ecological Appraisal (PEA).

Table 1. Ecological value criteria used in the ecological evaluation, as outlined by CIEEM.

Ecological Value	**Description and Examples**
High	Habitats or features that have high importance for nature conservation, such as statutory designated nature conservation sites of international or national importance or sites maintaining viable populations of species of international or national importance (e.g. Red Data Book species, European protected species).
Medium	Sites designated at a county or district level, e.g. Local Wildlife Site (LWS), ancient woodland site, ecologically 'important' hedgerows or ecological features that are notable within the context of a region, county or district (e.g. a viable area of a Priority Habitat on the county BAP or a site that supports a viable population of a county BAP species).
Low	Sites of nature conservation value within the context of a parish or neighbourhood, low-grade common habitats, such as arable fields and improved grasslands and sites supporting common, widespread species.

3.0 RESULTS

Site Location Description

3.1 The application site consists of an access road, a large, grassed verge, leading to a hardstanding covered yard supporting three buildings including a large open sided barn, workshop and an office building, with an adjoining open sided barn to the west of the site. There is an earth bank and hedge fringing much of the site. The site is used for storage and as a light industrial site (Figures 1 - 3, Annex 2). The site is fringed to the west by residential properties and pastureland upon all other aspects (Figure 2, Annex 2).

Designated Sites

3.2 A MAGIC (www.magic.gov.uk) study reveals that Copperhall Hanger Site of Special Scientific Interest (SSSI) occurs approximately 900m to the southwest of the site. This site receives its designated for its geological interest.

3.3 The site if fringed on all sides by small blocks of woodland within 1km form the site. The closest block of ancient woodland occurs approximately 550m to the west of the site (Figure 4, Annex 2). There is also a pond approximately 330m to the west of the site, Magic Maps indicates that this pond was subjected to a great created newt habitat suitability index in 2019. This pond supported a score of 0.30 (poor).

3.4 There are no EPS Licences recorded within 2km of the site (Figure 4, Annex 2).

Habitat survey

3.5 Habitats that would potentially be impacted by the proposed development consist of the following (JNCC Phase 1 codes in brackets) and Photos 1-8 (Annex 2):

- Building (J.3.6)
- Cultivated/disturbed land - amenity grassland (J.1.2)
- Bare ground (J.3.4)
- Intact hedge - species-poor (J.2.1.2)
- Introduced shrub (J.1.4)
- Earth bank (J.2.8)

3.6 A brief description of the habitats is provided below (see Figure 5; Annex 2).

Building

3.7 The site supports three buildings: The central open sided barn, the workshop and the open barn adjoining the office building. The central barn will be retained, and all other structures will be removed. The buildings are described in greater detail below.

Cultivated/disturbed land - amenity grassland

3.8 The access track to the south of the site is adjoined to the east by an area of tightly mown lawn (Photo 1-6; Annex 2). Given the mowing regium it was not possible to establish a species list for this area of lawn.

Bare ground

3.9 The site is dominated by concrete hardstanding throughout (Photos 1-6, Annex 2). Areas to the east of the site support a short sward of grasses and other small herb species over the top of the concrete (Photo 6, Annex 2).

Intact hedge - species-poor

3.10 The site is fringed mostly by a substantial hedge supporting native species including oak *Quercus robur*, hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, blackthorn *Prunus spinosa* and ash *Fraxinus excelsior* (Photo 7; Annex 2).

Introduced shrub

3.11 There is a block of vegetation fringing the site to the west of the workshop. This vegetation appears to be a species of ornamental coniferous tree (Photo 9; Annex 2).

Earth bank

3.12 The site is fringed on most sides by an earth bank to the inside of the hedge. This earth bank is vegetated supporting the following species: ox eye daisy *Leucanthemum vulgare*, nettle *Urtica dioica*, rye grass *Lolium perenne*, common bent *Agrostis capillaris*, bramble *Rubus* sp., herb robert *Geranium robertianium*, Yorkshire fog *Holcus lanatus*, narrow leaved dock *Rumex acetosa* and dogwood *Cornus sanguinea*.

3.13 Overall, the site habitats are considered to be of **low** ecological value.

Protected Species Survey

Bats

3.14 The site has **moderate** potential to support foraging and commuting bats, in particular along the vegetated margins of the site.

3.15 *Central open barn* - This structure is being retained. The barn is metal framed in construction, clad partly in metal sheeting (Photo 1, 4 & 5; Annex 2). The structure supports a **negligible** potential to support roosting bats.

Workshop – This building will be removed (Photos 9-11; Annex 2). This structure consists of a metal clad roof, timber framed lean too with a smaller, timber structure, clad in weather boarding (Photo 10; Annex 2). All external aspects of the barn are well fitting and devoid of potential roosting crevices, including the weather boarding. There is no evidence internally or externally that would suggest potential use by roosting bats. This structure supports a **negligible** potential to support roosting bats.

Western open barn and adjoining office – This structure is proposed to be removed. The building is compartmentalised into sections, with the barn to the north and office to the south. The barn is metal framed, with a corrugated tin roof (Photo 12; Annex 2) and is currently used for storage. The office building is timber in construction with a corrugated tin roof (Photos 13-14; Annex 2) and clad in well-fitting weather boarding (Photo 15; Annex 2). The office building supports no internal voids. All parts of both sections of the the structure are devoid of any features internally or externally that could be considered potentially suitable for supporting roosting bats. This structure supports a **negligible** potential to support roosting bats.

Amphibians and Reptiles

3.16 There are no habitats currently within the proposed works area that could be considered potentially suitable for supporting populations of reptiles or amphibians, given that most of this area consists of concrete hardstanding. There is a pond approximately 330m to the west of the site that scored poorly when subjected to a HSI in 2019. The vegetated earth bank fringing the site (Photo 7; Annex 2) has the potential to support habitat that could be considered potentially suitable for populations of reptiles. However, this area will remain unimpacted by the proposed works (Figure 3).

Nesting birds

3.17 The buildings have the potential to support nesting birds such as wren *Troglodytes troglodytes* and robins *Erithacus rubecula* could be using the barn as a nest site during the spring/summer months. A small portion of the southern hedge will be removed to make way for the new office building. These two areas of the site proposed to be impacted by the works have a **high** potential to support nesting birds.

Dormice

3.18 The hedge fringing the site has the potential to support populations of dormice (Photo 7; Annex 2). However, it is proposed that this hedge will be retained and unompacted by any of the proposed works. This fringing hedge is well connected to other hedges within the wider landscape and could be considered as supporting a **moderate** potential for supporting populations of dormice.

[redacted]

Other Mammals

3.20 The habitats on site, in particular the earth bank and hedge fringing the site support the potential to be used by European hedgehog *Erinaceus europaeus* and foxes *Vulpes vulpes*. There is potential for these species to forage across the footprint of the proposed works.

Invasive species

3.21 No invasive species were recorded.

4.0 ECOLOGICAL EVALUATION

Designated Nature Conservation Sites

4.1 The nature and scale of the proposed development will not impact any statutory protected areas.

Habitats

4.2 The areas of the site that will be impacted, currently supports the following predominant habitats: building, bare ground, earth bank, native hedge, introduced shrub and amenity grassland. There are no UK Biodiversity Action Plan (UKBAP) habitats within the site. The site could be considered to support habitats of **low** ecological value.

Protected Species

Flora

4.3 None of the species recorded during the survey are specifically protected by the Wildlife and Countryside Act 1981 (as amended) or considered nationally or locally rare (see Preston et al., 2002[7]). Also, none of the species recorded are listed as Species of Principal Biological Importance on Section 41 of the NERC Act 2006 or as Priority Species on the national BAP (UK BAP, 2007[8]).

4.4 Mitigation and enhancements for general flora are recommended in Sections 6 and 7.

Fauna

4.5 The area of the site proposed to be impacted, could be used by foraging and commuting mammals including European hedgehog, [redacted] and foxes.

4.6 The areas of the site proposed to be impacted, have **medium** potential to support foraging and commuting bats.

4.7 Areas of the site proposed to be impacted, have high potential to support nesting birds during the spring/summer months.

[7] Preston, C.D., Telfer, M.G., Arnold, H.R., Carey, P.D., Cooper, J.M., Dines, T.D., Pearman, D.A., Roy, D.B. & Smart, S.M. 2002. *The changing flora of the UK*. Department for Environment, Food and Rural Affairs, London.
[8] UKBAP (2007) Report on the Species and Habitat Review: Report by the Biodiversity Reporting and Information Group (BRIG) to the UK Standing Committee, June 2007

5.0 RECOMMENDATIONS

5.1 Wherever possible, negative ecological impacts should be avoided. If this is unavoidable then mitigation and compensation measures will be proposed for adverse ecological effects. In addition, it is best practice to seek positive biodiversity benefits through enhancement measures, in particular with regard to Priority Habitats and Species listed on the national and local Biodiversity Action Plans and the NERC Act 2006.

5.2 Given the size of the site and available space, it would be advantageous to move the proposed footprint of the office building north, in order to preserve the earth bank and hedge fringing the site. These habitats have the potential to support populations of dormice, reptiles and nesting birds.

5.3 CIEEM (2017)[9] endorses the following principle, recommended by the Royal Town Planning Institute (2019)[10] for optimising the biodiversity outcomes of planning decisions.

5.4 New benefits: seek to provide net benefits for biodiversity over and above requirements for mitigation and compensation.

5.5 The provision of compensation/enhancements helps local planning authorities in meeting requirements as stipulated under the National Planning Policy Framework[11], which states that sustainable development should seek to achieve net gains in biodiversity for nature.

[9] *CIEEM (2017) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition.* Chartered Institute of Ecology and Environmental Management, Winchester.
[10] https://www.rtpi.org.uk/practice/2019/november/biodiversity-in-planning/
[11] National Planning Policy Framework. (2023) Department of Communities and Local Government.

6.0 MITIGATION & FURTHER SURVEY

Habitat

6.1 No further habitat surveys are currently required within the site.

Bats

6.2 No further surveys for bats are proposed for the site. However, given the potential for foraging, and commuting bats within the site, artificial lighting should be managed in a way whereby it will not impact upon foraging bats within the area, in particular the boundary hedges. Annex 3 details the Bat Conservation Trust guidelines on lighting mitigation. External lighting proposed for the new development should be positioned low to the ground, with downward facing baffles and set on timers or motion sensors. Warm white LED lights have the least impact upon bats.

Birds

6.3 Demolition works to the buildings and any proposed clearing/felling of the hedge to make way for the new office building on the southern boundary, should be timed outside of the bird breeding season (generally considered to be from March – August). However, some species are known to nest outside of these periods. If it becomes necessary to do works during these periods the building/vegetation should first be checked by a suitably experienced ecologist prior to works. If active nests are found a 5m buffer should be left.

Other Mammals

6.4 The development site has potential to support commuting mammals such as hedgehogs, [redacted] and foxes. It is recommended that during construction all deep trenches and excavations are covered overnight to prevent any animals falling in and not being able to get out.

6.5 The mitigation measures should form part of a Biodiversity Enhancements and Mitigation Plan (BEMP), to be secured by an appropriate planning condition. This should ensure compliance with local and national policies.

7.0 ENHANCEMENTS

7.1 In line with local and national policy (NPPF 2021[12]), the new development should seek to provide biodiversity enhancements. These biodiversity enhancements should be at a minimum of a 10% net gain following the legislation outlined The Environment Act 2021. The following suggestions would also enhance the site for wildlife:

Shrub/Tree Planting

7.2 The tree planting proposed for the site and detailed in Figure 3 within the west of the site, should use native species to improve the site for biodiversity. A list of native species that are beneficial to pollinating insects, produced by the Royal Horticultural Society, is provided in Appendix 3.

Species rich turf

7.3 It is recommended that any turfed areas within the proposed development are enhanced through the laying of species rich turf[13]. This turf is designed to be subjected to a regular domestic mowing regium. However, all or part of the lawn can be left to flower and subjected to an annual hay cut.

Bird Boxes

7.4 Several nest boxes for different species of bird (sparrow, tits, robins, thrushes and wrens) should be erected around the site, in particular upon the new buildings within the site[14][15].

Bats

7.5 A guide to bat friendly gardening is provided in Annex 4. Further bat roosting enhancement measures should be integrated into the walls of the new buildings[16].

7.6 The biodiversity enhancements should form part of a Biodiversity Enhancements and Mitigation Plan (BEMP), to be secured by an appropriate planning condition. This should ensure compliance with local and national policies.

[12] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[13] http://www.wildflowerturf.co.uk/Products/species-rich-lawn-turf.aspx
[14] http://www.birdbrickhouses.co.uk/brick-nesting-boxes/integrated-bird-box/
[15] https://www.wildcare.co.uk/wildlife-nest-boxes/bird-boxes/building-integrated-bird-boxes.html
[16] https://www.nhbs.com/ibstock-enclosed-bat-box

8.0 CONCLUSION

8.1 It is proposed that the two of the three buildings will be demolished and replaced. The survey of the site has highlighted a limited number of potential ecological constraints. Mitigation to protect nesting birds, foraging bats and other foraging mammals such as [redacted] and hedgehogs are detailed. Ecological enhancements are detailed within this report. A BEMP is to be secured by an appropriate planning condition.

9.0 REFERENCES

Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn). The Bat Conservation Trust, London.

Department of Communities and Local Government (March 2012) National Planning Policy Framework.

Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment.

JNCC (2010) *Handbook for Phase 1 Habitat Survey: a technique for environmental audit.* JNCC, Peterborough.

MAGIC Site Check Report. Available: www.magic.gov.uk.

Mitchell-Jones, J. (2004) Bat Mitigation Guidelines. Natural England.

Mitchell-Jones, A.J. and Mc Leish, A.P. (2004) Bat Workers Manual. JNCC

Annex 1 – Protected Species Legislation.

Plants

All wild plants are protected against unauthorised removal or uprooting under Section 13 of the Wildlife and Countryside Act 1981 (as amended). Plants listed on Schedule 8 of the Act (e.g. triangular club rush and Deptford Pink) are afforded additional protection against picking, uprooting, destruction and sale. Bluebell is protected against sale only.

Amphibians (Common Species)

Common amphibian species (i.e. common frog, common toad, smooth newt and palmate newt) are afforded partial legal protection under UK legislation, i.e. Schedule 5, Section 9 (5) of the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000. This legislation prohibits:

- sale
- transportation
- advertising for sale

[redacted]

Bats

All bat species are afforded full protection under UK and European legislation, including the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way Act 2000 and The Conservation of Habitats and Species Regulations 2017. Together, this legislation makes it illegal to:

- Intentionally or deliberately take, kill or injure a bat
- Damage, destroy or obstruct access to bat roosts
- Deliberately disturb bats

A bat roost is defined in the legislation as *"any structure or place which a bat uses for shelter or protection". Roosts are protected whether or not bats are present at the time.* If a development activity is likely to result in disturbance or killing of a bat, damage to its habitat or any of the other activities listed above, then a licence will usually be required from Natural England.

Birds

The bird breeding season generally lasts from early March to September for most species. All birds are protected under the Wildlife and Countryside Act (1981) (as amended) and the Countryside & Rights of Way Act 2000. This legislation makes it illegal, both intentionally and recklessly to:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird while it is being built or in use;
- Take or destroy the eggs of any wild bird; and
- Possess or control any wild bird or egg unless obtained legally.

Birds listed under Schedule 1 of the Wildlife and Countryside Act (1981) (as amended) (e.g. barn owl and kingfisher) are afforded additional protection, which includes makes it an offence to disturb a bird while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Great crested newts

Great crested newts and their habitat are afforded full protection under UK and European legislation, including the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way Act 2000 and The Conservation of Habitats and Species Regulations 2017. This makes it is an offence to kill, injure or disturb great crested newts and to destroy any place used for rest or shelter by a newt. The great crested newt is also listed on Annexes II and IV of the EC Habitats Directive and Appendix II of the Bern Convention. If a development activity is likely to result in disturbance or killing of a great crested newt, damage to its habitat etc, then a licence will usually be required from Natural England.

Reptiles

There are six native species of reptiles in the UK, including the slow-worm (*Anguis fragilis*), viviparous lizard (*Zootoca vivipara*), grass snake (*Natrix natrix*) and adder (*Vipera berus*), smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*), which are afforded varying degrees of protection under UK and European legislation.

Slow-worm, viviparous lizard, adder and grass snake are protected under Schedule 5, Section 9 (1 and 5) of the Wildlife and Countryside Act 1981 (as amended) and the Countryside & Rights of Way Act 2000 against deliberate or reckless killing and injuring and sale.

Otters

Great Otters are fully protected under the Habitats Regulations through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species
- Damage or destruction of a breeding site or resting place
- Deliberate disturbance of otters as:
    - to impair their ability:
    - to survive, breed, or reproduce, or to rear or nurture young;
    - to hibernate or migrate
    - to affect significantly the local distribution or abundance of the species

Otters are also currently protected under the WCA through their inclusion on Schedule 5. Under this Act, they are additionally protected from

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection

Annex 2 – Plans, Figures and Photographs.

Figure 1 - Approximate location of the site (red outline). Image taken from Google Earth.

Figure 2 - Approximate location of the site (red shape) within the wider landscape. Image taken from Google Earth.

Figure 3 – (left) Site plan showing the existing location. (right) Proposed development. Image produced by Philips Surveyors.

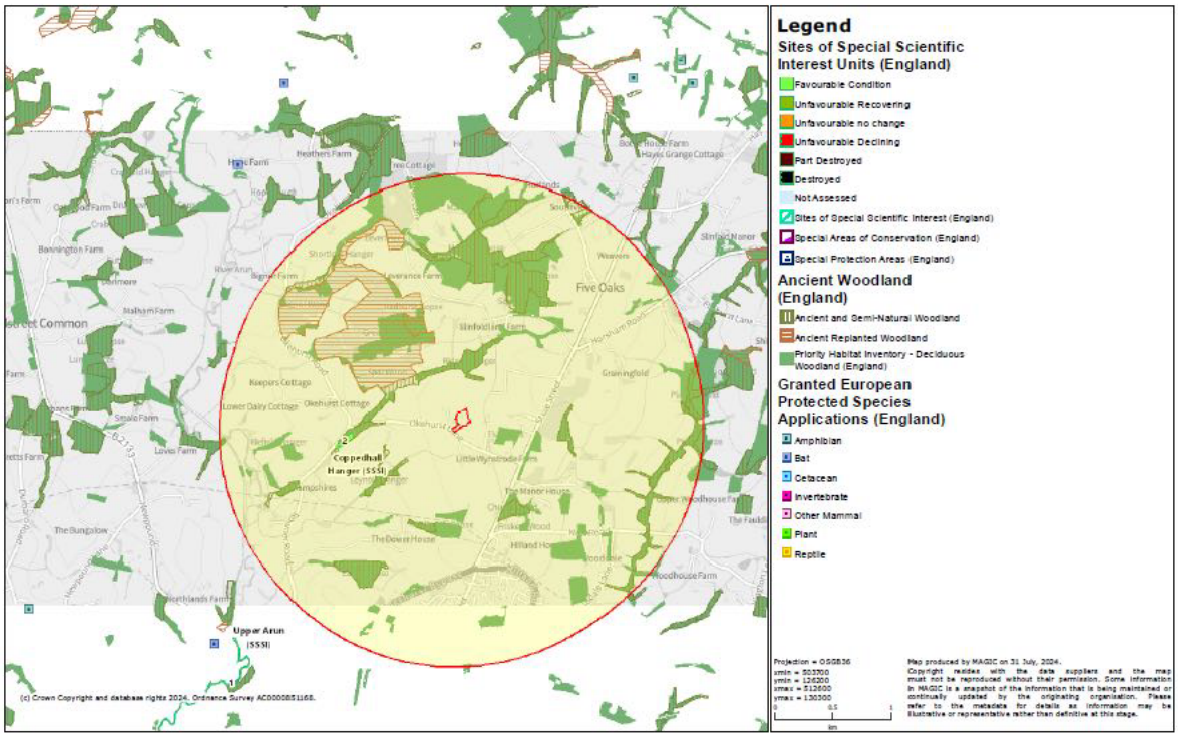

Figure 4 – Magic map showing the locations of the site (red block), with ancient woodland (brown cross hatch), deciduous woodland (green), locations of statutory protected areas (light green), EPS mitigation licence applications (blue box) within 2km of the site.

Figure 5 – Modified site plan, showing the approximate outline of the site in red with main habitats. Image developed from image produced by Philips Surveyors.

Photographs

Photograph 1 – Concrete track entry to the site fringe to the east by amenity grassland and native species hedge.

Photograph 2 – Centre of the site looking north at central open sided barn within the centre of the site.

Photograph 3 – Western section of the site looking north showing enclosed barn.

Photograph 4 – Central open sided barn.

Photograph 5 – The internal aspects of the central barn.

Photograph 6 – The eastern aspects of the site showing bare ground.

Photograph 7 – Earth bank upon the eastern boundary with native species hedge.

Photograph 8 – Southern section of the site.

Photograph 9 – The eastern barn.

Photograph 10 – The eastern elevation of the eastern barn.

Photograph 11 – Internal aspects of the western barn.

Photograph 12 – The internal aspects of the open sided barn.

Photograph 13 – Southeast elevation of the office building with adjoining barn in the background.

Photograph 14 – Southern elevation of the office building.

Photograph 15 – The western elevation of the office building showing well-fitting weather boarding.

Photograph 16 – Western elevation of the office building with adjoining barn.

Annex 3 – Lighting guidance - the impact of artificial light on bats

The following basic set of guidelines is summarized from the latest Guidance Note (08/18)[17] provides a concise checklist of points to consider with any lighting scheme:

- *Use professional lighting design engineers to model and predict light spill so that it can be avoided.*
- *Reduce light levels to the minimum necessary to meet legal and safety requirements.*
- *Reduce horizontal and upward/downward light spillage to the minimum achievable. The use of cowling, masks, louvers etc. and limiting the height of lighting columns may be important depending on the design of the lighting units. No bare bulbs. Lighting should only light the target area.*
- *Use non-reflective surfaces within the area to be lit to minimise indirect (reflected) spillage of light. The use of planting or other structures to add screening.*
- *Reduce the duration of lighting. The use of lighting 'curfews' can also be helpful - especially in the vicinity of bats roosts. For example, the emergence of bats, typically within the hour after sunset, may be disrupted (delayed) by raised light levels and this may result in a loss of feeding opportunities.*
- *Consider the type of light to be used and whether a different type or design may reduce potential impacts on bats and other wildlife. Narrow spectrum lighting with minimal UV emission should be used.*
- *Use 'screen planting' to limit light spill into dark areas*.
- *Use narrow spectrum light sources* to lower the range of species affected by lighting, as research has shown that spectral composition does impact biodiversity.
- *Use light sources that emit minimal ultra-violet light*
- *Avoid white and blue wavelengths of the light spectrum* to reduce insect attraction and where white light sources are required in order to manage the blue short wave length content they should be of a warm / neutral colour temperature <4,200 kelvin.

For more details, please refer to:

https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

http://www.bats.org.uk/pages/bats_and_lighting.html

http://www.batsandlighting.co.uk/index.html

[17] https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

Annex 4 – Gardening for bats.

GARDENING FOR BATS

All sixteen species of bats in the UK eat insects, and need a good supply of these from spring through to the autumn. By growing flowers attractive to a range of insects, our gardens can become important feeding stations for bats, birds and other wildlife.

Many plants depend on insects

We grow flowers in our gardens for our own enjoyment. But colour and perfume are really the plants' way of advertising themselves to insects. Sweet nectar and protein-rich pollen are bait to encourage insects to visit. In return, pollen is carried from one flower to another on their bodies so the flowers are fertilised.

Bats need insects

Flying uses a lot of energy, so bats have huge appetites. All our UK bats eat insects. Five species, including the long-eared bat, prefer moths, but most bats rely more heavily on flies as food than any other insect group. Especially important are craneflies, and a range of midge families and their relatives. Pipistrelles, the bats most likely to visit your garden, depend on catching very large numbers of tiny insects, some of which are pests.

Flower shape and insect tongues

Flowers with long narrow petal tubes, such as evening primrose and honeysuckle, are visited by moths and butterflies. Only their long tongues can reach deep down to the hidden nectar.
Short-tongued insects include many families of flies and some moths. They can only reach nectar in flowers with short florets.
By planting a mixture of flowering plants, vegetables, trees and shrubs, you can encourage a diversity of insects to drop in and refuel.

Follow these general rules

? Plant flowers varying not only in colour and fragrance, but also in shape.
? Daisies and daisy-like flowers are open with a mass of shallow florets.
? Pale flowers are more easily seen in poor light.
? Single flowers have more nectar than double varieties
? Native wild flowers or those closely related are most useful
? Flowers with landing platforms and short florets such as daisy or carrot family attract many insects.
? Many flowering vegetables such as beans and courgettes are also good for insects.

Plant trees and shrubs

These are important in providing

- food for insect larvae
- food for adult insects
- shelter for flying insects
- roosting opportunities for bats.

In a small garden, choose trees that can be coppiced – cut down to the ground every few years - to allow new shoots to spring from the base. Young shoots and leaves will support leaf-eating insects, even if they do not produce flowers. Hawthorn and elder are useful small trees.

Create a wet area

A pond, a marshy area, even a half-tub made into a mini-pond can attract insects. Many of the tiny flies favoured by bats start life in water as aquatic larvae.

Say NO to insecticides

Chemical pesticides kill natural predators and so may do more harm than good. They reduce bats' insect prey, and surviving insects carry traces of poison.

Encourage natural predators

Hoverflies, wasps, ladybirds, lacewings, ground beetles and centipedes are the gardener's friends. As natural predators they help keep the balance, eating many pests.
? Allow some weeds to grow to provide ground cover for natural predators
? Grow favourites of hoverflies and other predators close to the flowers and vegetables that tend to become infested.
? Leave hollow-stemmed plants to overwinter as shelter for ladybirds.
? Leave heaps of dead leaves and brushwood undisturbed for hedgehogs.
? Most garden birds are effective predators. Provide them with regular food and water.

Prevent a CATastrophe

Many bats and other small mammals fall prey to Britain's most dangerous four-legged predator, the domestic cat. Cats do not need to stay out all night. Bring you cat in an hour before sunset so bats can emerge undisturbed.
(Send for our special leaflet on cats and bats.)

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Gardening for bats

Aim at having flowers in bloom through the year, including both annuals and herbaceous perennials.
Below are some suggestions, but this is by no means an exhaustive list. See what grows well in YOUR garden, and what seems most attractive to insects.
Flowering times are approximate, varying in different areas. Regular dead-heading extends flowering period in many flowers. A=annual, HA=hardy annual, HHA=half-hardy annual, P=perennial, W=wild flower.

Flowers for borders			
St John's Wort	*Hypericum*	P	March-
marigolds	*Calendula*	H/A	March – Oct.
aubretia	*a. deltoidea*	P	March-June
honesty	*Lunaria redva*	HB	March
forget-me-not	*Myosotis sp.*	A/P	March - May
elephant ears	*Bergenia*	P	April
Wallflowers	*Erysimum*	B	April - June
Cranesbills	*Geranium sp*	P	May – Sept.
Yarrow	*Achillea*	P	May -
Poppies	*Papaver sp.*	A	May - July
Dames violet	*Hesperis matronalis*	P	May - August
Red Valerian	*Centranthus ruber*	P	May – Sept.
Poached egg plant	*Limnanthes*	HA	June – Aug.
Knapweed	*Centaurea nigra*	P	June- Sept.
Phacelia		HA	June – Sept.
Ox-eye daisy	*Leucanthemum vulgare*	P	June – Aug.
Evening primrose	*Oenothera biennis*	B	June-Sept.
Candytuft	*Iberis umbellata*	HA	June – Sept.
Sweet William	*Dianthus barbatus*	B	June - July
Blanket flowers	*Gaillardia*	P	June -
Verbena	*V.bonariensis*	HHA	June – Oct.
Scabious	*knautia arvensis*	P	July-Aug.
Night-scented stock	*matticla bicornis*	HA	July-Aug
Pincushion flower	*Scabious sp.*	A/P	July – Sept.
Cherry pie	*heliotrope*	HHA	July – Oct.
Mexican aster	*Cosmos sp.*	A/P	July – Oct.
Cone flower	*Rudbeckia sp.*	A/P	August-Nov.
Mallow	*lavatera sp.*	P	August-Oct.
Michaelmas daisy	*Aster sp.*	P	August-Sept.
Ice plant 'Pink lady'	*Sedum spectabile*	P	Sept.
Herbs – both leaves and flowers are fragrant			
Fennel	*Foeniculum vulgare*		July – Sept.
Bergamot	*Monarda didyma*		June - Sept
Sweet Cicely	*Myrrhis odorata*		April - June
Hyssop	*Hyssopus officianlis*		July - Sept
Feverfew	*Tanacetum parthenium*		June – Sept.
Borage	*Borago officinalis*		May – Sept.

Rosemary	*Rosemary officinalis*		March - May
Lemon balm	*Melissa officinalis*		
Coriander	*Coprianum sativum*		June - August
Lavenders	*Lavendula sp.*		
Marjoram	*Origanum sp*		
Trees, shrubs and climbers important to insects			
Oak	*Quercus sp.*	large gardens only	
Silver birch	*Betula pendula*		
Common alder	*Alnus glutinosa*	Suitable for coppicing	
Hazel	*Corylus avellana*	Suitable for coppicing	
Elder	*Sambucus nigra*	Small	
Pussy willow	*Salix caprea*	Suitable for coppicing	
Hawthorn	*Crataegus monogyna*	Suitable for coppicing	
Honeysuckle	*Lonicera sp.*	grow a variety for succession.	
Dog rose	*Rosa canina*	Climber	
Bramble	*Rubus fruticosus*	Climber	
Ivy	*hedera helix*	Climber	
Buddleia	*Buddleia davidi*	shrub	
Guelder rose	*Viburnum opulus*	shrub	
Gorse	*Ulex sp.*	shrub	
Plants for pond edges and marshy areas			
Purple loosestrife	*Lythrum salicaria*	W	June – Aug.
Meadow sweet	*Filipendula ulmaria*	W	June – Sept.
Lady's smock	*Cardamine pratensis*	W	April - June
Water mint	*mentha aquatica*	W	July – Sept.
Angelica	*Angelica sylvestris*	W	July – Sept.
Hemp agrimony	*Eupatorium cannabinum*	W	July – Sept.
Marsh marigold	*Caltha palustris*	W	March – May
Creeping Jenny	*Lysimachia nummularia*	W	May - August
Fringed water lily	*Nymphoides peltata*	W	June – Sept.
Water forget-me-not	*Myosotis scorpioides*	W	June – Sept.

Allow part of your lawn to grow long in summer and cut in autumn, removing the clippings. Avoid using fertilizers.
Compost heaps are good producers of insects too.

Add a seat to watch your garden come to life!

Native Plant Species Recommended

Hedging/shrubs (60cm whips)	
Blackthorn	*Prunus spinosa*
Hawthorn	*Crataegus monogyna*
Common Dogwood	*Cornus sanguinea*
Guelder Rose	*Viburnum opulus*
Holly	*Ilex aquifolium*
Elder	*Sambucus nigra*
Field Maple	*Acer campestre*
Hazel	*Corylus avellana*
Spindle	*Euonymus europaeus*
Trees (regular standard size)	
Apple	*Malus spp.*
Cherry	*Prunus spp.*
Field Maple	Acer campestre
Hornbeam	*Carpinus betulus*
Rowan	*Sorbus aucuparia*
Wild Service	*Sorbus torminalis*
English Oak	*Quercus robur*
Shrubs/Herbacous plants (formal beds)	
Use species attractive to pollinators e.g bees, butterflies, moths. See this selection of RHS plants for pollinators: http://www.rhs.org.uk/Gardening/Sustainable-gardening/Plants-for-pollinators (see Appendix 4)	
Note – all specimens should be of British native stock from reputable suppliers.	