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investigate design resolve

PRELIMINARY ECOLOGICAL APPRAISAL FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT BRIAR FARM: LAND OFF MENDHAM LANE, HARLESTON, NORFOLK, IP20 9DW

Prepared For

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V2	13-12-18	Minor changes to descriptions

EXECUTIVE SUMMARY

Ecological Survey Data Review	
Report Description	Geosphere Environmental Limited was commissioned by M Scott Properties Ltd to undertake a Preliminary Ecological Appraisal of the land at Briar Farm: Land off Mendham Lane, Harleston, Norfolk. The site is located at National Grid Reference 625260, 282920. The report relates to the proposed redevelopment of the site for residential use. The proposed development covers an area of approximately 27.13 hectares (ha). This and the immediate surrounding area were surveyed.
Summary of Main Findings	The site is comprised of large arable fields with grassland field margins. Dividing the fields and bordering the boundaries of the site are hedgerows, trees and dry ditches. There are eight building within the centre of the site, these include a residential house, garages and farm buildings. Hardstanding and an amenity grassland garden are also located in the centre of the site, in association with these buildings. As well as these habitats, a pond is also situated on site and additional ponds are located within the surrounding area. Habitats that may be affected by the proposed works include those which may support legally protected species, particularly the poor semi-improved grassland, hedgerows, trees, pond and buildings B1, B2, B3 and B7. Depending on the results of further protected species surveys, the value of these habitats may increase further. The site is not considered suitable for Otter, Water Vole and Hazel Dormouse. There are suitable features, within the area to be affected by the proposed development, which may provide habitat for protected species, in particular: o Roosting Bats: 29 trees on/adjacent to site, as well as buildings B1, B2, B3 and B7, have suitable features that could support roosting bats; o Foraging Bats: The hedgerows, trees and grassland provide moderate suitability for foraging and commuting bats; o GCN: Ponds P1, P2 and P3 are all considered suitable for breeding Great Crested Newts and are either on site or connected to the terrestrial habitats (hedgerows and poor semi-improved grassland) on site; o Birds: The hedgerows and trees, as well as the buildings within the site, provide suitable nesting habitat for breeding birds during the breeding season; o Reptiles: The hedgerows and grassland on site could provide habitat for reptiles.
Ecological Constraints	The constraints to development will be the removal or disturbance of the poor semi-improved grassland, hedgerows, trees and pond which could impact either roosting bats, foraging and commuting bats, breeding birds, reptiles or Great Crested Newts.
Recommendations	o Any hedgerows or trees to be retained should be protected during the works, according to BS 5837: 2012 'trees in relation to design, demolition and construction' (ref. R.11). o 29 trees on/adjacent to site have suitable features that could support roosting bats. All trees with moderate or high bat roost potential will be retained within the development. However, it is unclear at this stage whether construction works are required within the root protection areas of these tree, as defined in BS 5837:2012 (ref. R.11) or the extent of lighting overspill. Should the trees be likely to be impacted by the development, then activity surveys will be required.

	Trees with moderate potential require two separate survey visits and those with high potential require three, from May to September; o Within the proposed development two trees with low bat roost potential require removal. Prior to pruning/felling of trees with low bat roost potential, an Arborist should check any features within the trees, to ensure the absence of roosting bats. Precautionary measures such as careful cutting and lowering of limbs should be followed; o Buildings B1, B2, B3 and B7, have suitable features that could support roosting bats. Building B7 will be removed during development. Given the close proximity of buildings B1 to B3 to the demolition area it is likely that these buildings will be indirectly impacted by lighting and noise during/post development. Surveys are, therefore, required on all buildings with bat roost potential to determine presence/absence. Buildings with low potential for roosting bats (B1, B3 and B7) require one survey visit, and buildings with high potential for roosting bats (B2), require three survey visits, from May to September; o Much of the habitats considered suitable for foraging and commuting bats will be retained. However, further surveys are required to determine the number of bats and species using the site, in order to assess potential indirect impacts of the proposed development and potential enhancement options. A minimum of three surveys should be undertaken from May to September; o Surveys for Great Crested Newts are required for Ponds P1-P3, either using eDNA techniques and/or by using traditional methods of survey. Sampling of eDNA can only be undertaken between 15 April and 30 June (if the results indicate presence of GCN, then traditional survey visits must also be carried out) and traditional GCN surveys can be undertaken between mid - March and mid-June; o A reptile survey is required to determine presence/absence (April to October); o Vegetation clearance or building demolition should be undertaken outside of the bird nesting season (from September to February) or under supervision of a suitably qualified ecologist.
Biodiversity Enhancement Opportunities	The following has been recommended for consideration within the final development scheme: o Any plants considered within the final development should ideally be native and considered beneficial to wildlife. Fruit/berry producing trees could be considered in order to provide a local food source for birds; o Log piles for invertebrates; o Nest boxes or nest bricks for common passerine birds; Holes in the bottom of garden fences should be included to provide habitat connectivity for foraging hedgehogs.
Conclusions	The recommendations within Section 6, of this report should be adhered to, to reduce the impact upon protected species.

CONTENTS

CONTENTS

APPENDICES

TABLES

1. INTRODUCTION

1.1 General

Geosphere Environmental Ltd was commissioned by M Scott Properties Ltd, to undertake a Preliminary Ecology Appraisal (PEA) of the site at Briar Farm: Land off Mendham Lane, Harleston, Norfolk, IP20 9DW.

Any limitations and conditions pertaining to the report are stated within Appendix 1, with a full list of technical references provided within Appendix 2.

The report relates to the proposed development of the 27.13-hectare (ha) site for residential use. The site is located at National Grid reference 625260, 282920.

The development boundary is shown in Figure 1, below:

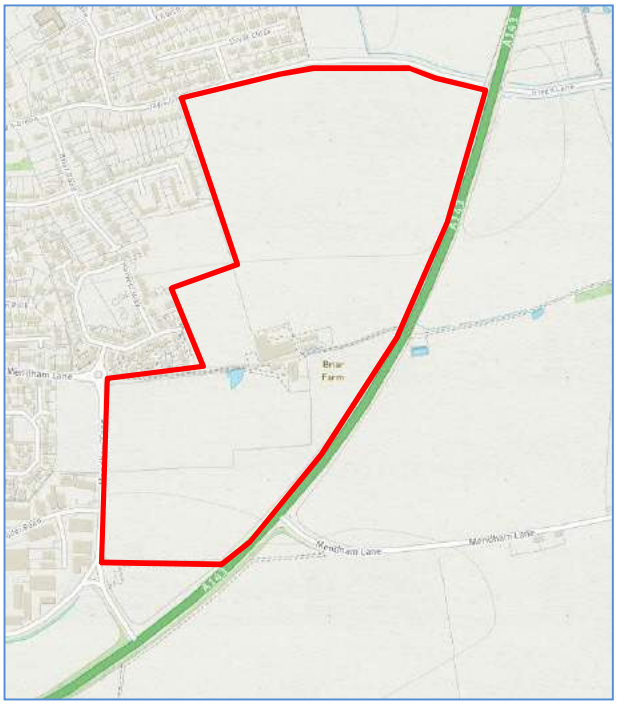


Figure 1 –The proposed development boundary is outlined in red.

1.2 Aims

This report provides baseline data for the assessment of the sites ecological features and identifies any potential constraints with regards to protected species. It also outlines recommendations for further surveys if necessary.

1.3 Current UK Legislation

The main legislation that applies to ecological issues within England and Wales are as follows:

- The Conservation of Habitats and Species Regulations 2010, consolidating all amendments to the Conservation, (Natural Habitats etc.), Regulations 1994. This legislation implements the EU Habitats Directive and also contains new provisions designed to implement aspects of the Marine and Coastal Access Act 2009 for England and Wales. These regulations place a duty on the UK to designate sites of

European Community importance as special areas of conservation, (SACs), and to protect European species of conservation concern.

- The Wildlife and Countryside Act 1981, (WCA) was amended by the Wildlife and Countryside (Amendment) Act 1985 and the Countryside and Rights of Way Act 2000, (CRoW). The Act provides various levels of protection for wild birds, including species listed in Schedule 5, protected under Section 9, (animals which are protected). In addition, wild plant species listed under Schedule 8, are also protected from intentional or reckless picking, uprooting or destruction including any seed or spore of these plants,
- The Natural Environment and Rural Communities, (NERC), Act 2006 imposes an obligation on all public bodies, including Local Authorities, to consider whether their activities can contribute to the protection of wildlife. Section 41, (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. There are 943 species of principal importance and fifty-six habitats of principal importance included on the S41 list.
- Badgers (Meles meles) are protected under the Protection of Badgers Act 1992, (PBA), making it a criminal offense to wilfully kill, injure, take, possess or cruelly ill-treat a Badger, or to attempt to do so or to intentionally or recklessly interfere with a sett.

1.4 Site Specific Legislation

1.4.1 Bats

All bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. It is illegal to kill or injure bats, cause disturbance at their resting places or to block access to, damage or destroy their roost sites.

1.4.2 Great Crested Newts

Great Crested Newts are protected under the Wildlife and Countryside Act 1981 (as amended) Section 5, and the Conservation of Habitats and Species Regulations 2010. It is illegal to intentionally or deliberately kill, injure or capture Great Crested Newts or intentionally, deliberately or recklessly damage or destroy their breeding and resting places or obstruct access to their place of shelter or protection.

1.4.3 Birds

Wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). It is illegal to take or harm them, their nests (whilst in use or being built) or their eggs.

Additionally, for some species listed under Schedule 1, of the Act, it is an offence to intentionally or recklessly disturb the adults while they are in and around their nest or intentionally or recklessly disturb their dependent young.

1.4.4 Reptiles

Common reptiles include Slow-worm, Adder, Grass Snake and Common Lizard. These are protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5, Sections 9 (1) & 9 (5) only. It is illegal to kill or injure them.

It is not illegal to capture, disturb or to damage their habitats. However, the reptiles themselves are protected so any works to damage their habitat could risk causing harm to reptiles and hence could be illegal.

Rare reptiles which include Sand Lizard and Smooth Snake are restricted to a few locations in Britain and are fully protected under the Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9, and the Conservation of Habitats and Species Regulations 2010. It is illegal to kill, injure or intentionally disturb them whilst occupying a 'place used for shelter or protection' and destruction of these places.

2. TECHNICAL APPROACH

The PEA has been undertaken following guidelines provided by CIEEM's Guidelines for Preliminary Ecological Appraisal (ref. R.1) and BS 42020: 2013 Biodiversity standards (ref. R.2).

A desk study and ecological site walkover has been undertaken in accordance with the key principles of the Ministry of Housing, Communities and Local Government (MHCLG) (July 2018) National Planning Policy Framework (NPPF) (ref.R.3), and Government Circular 05/06: Biodiversity and Geological Conservation – statutory obligations and their impact within the planning system (ref. R.4) to provide an indication of the ecological value of the site and the potential for the site to be used by protected species.

The habitat survey was undertaken in general accordance with JNCC methodology (ref. R.5). Scientific names and common names of plant species identified are as they appear in Stace (ref. R.6).

The conclusions and recommendations for further works are in accordance with current legislation and guidance.

2.1 Ecological Desk Study

A data search was conducted of freely available biological records. The sources of information included:

- Natural England Magic website for geographic information on key statutory designated nature conservation sites within 2km of the site (ref. R.7);
- Norfolk Biodiversity Information Service (NBIS) and Suffolk Biodiversity Information Service (SBIS) were contacted to provide details of legally protected species and non-statutory designated conservation sites within 2km of the site;
- Ordnance survey maps were used to identify ponds/ditches within 500m of the site to assess the potential for Great Crested Newt (GCN) within the immediate vicinity of the site.

All relevant desk study data obtained is attached in Appendix 4.

2.2 Preliminary Ecological Appraisal

The surveys used to inform the Preliminary Ecological Appraisal comprise of a Phase 1 habitat and protected species scoping survey, more often referred to as an extended Phase 1 habitat survey.

The Phase 1 habitat survey involved a walkover of the site in which the habitats are classified according to JNCC phase 1 habitat survey guidelines (ref. R.5). The frequency and cover of each species identified as they are distributed in each habitat is estimated using the DAFOR scale (ref. R.8) as follows:

- Dominant - >75% cover;
- Abundant – 51-75% cover;
- Frequent – 26-50% cover;
- Occasional – 11-25% cover;
- Rare – 1-10% cover;
- Locally dominant (LD), abundant (LA) and frequent (LF) is also used where the distribution is patchy.

The site was assessed for its suitability to support protected species and other species of conservation importance which could pose a planning constraint. All signs and areas of habitat considered suitable for protected species or those of conservation interest were recorded and photographed. These include burrows, droppings, footprints / paths, hairs, refuges and particular habitat types, such as ponds, known to be used by certain class of fauna. Any mammal paths found were noted down and followed where possible. Sites are taken in the context of their surroundings and so include the immediate environs outside of site boundaries where appropriate.

2.3 Habitat Suitability Index

All ponds/ditches identified within 500m of the Site were assessed for their suitability to support GCN, where access was possible. A Habitat Suitability Index (HSI) (ref. R.9), can be used to assess the suitability of a pond for GCN, based upon a number of factors including the size, water quality, permanence, shading, presence of fish, the number of nearby ponds and macrophyte cover. A score between 0 and 1 is given; where 0 represents poor suitability and 1 represents excellent suitability.

2.4 Ecological Impact Assessment

The ecological evaluation and impact assessment detailed below is based upon CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom, (ref. R.10).

CIEEM Guidelines state that the value or potential value of an ecological resource or feature should be determined within a defined geographical context from an international to site scale as follows:

- On an International scale, e.g. Ramsar, SAC or SPA site;
- On a UK scale, for example a SSSI or a National Nature Reserve, (NNR);
- On a National scale, e.g. a reserve of importance to England/Northern Ireland/Scotland/Wales;
- On a Regional scale, e.g. a local site with important regional habitats or UKBAP species;
- On a County scale, e.g. a local site with a habitat that is characteristic of the County or rare on a County scale, or with LBAP species;
- On a District scale, e.g. a site with wildlife corridors likely to improve the biodiversity of the area;
- Local or Parish, e.g. areas of green space in a predominantly urban environment;
- On a Site scale, e.g. habitats with value within the zone of influence only.

The potential for protected species to use the habitats on site contributes significantly towards the potential value of the habitats on site.

3. DESK STUDY RESULTS

All relevant desk study data obtained is attached in Appendix 4, except for detailed lists of species given the sensitive nature of the information.

3.1 Statutory Designated Nature Conservation Sites

A single statutory designated nature conservation site is located within 2km of the site. Gawdyhall Big Wood Harleston is designated a Site of Special Scientific Interest (SSSI), and is located 1.2km north of the site. This 30 hectares (ha) site comprises of ancient woodland and is separated from site by agricultural fields and roads.

No sites with European protection were identified within a 13km radius.

3.2 Non-Statutory Designated Nature Conservation Sites

Three non-statutory designated nature conservation sites are located within 2km of the site. All three are designated County Wildlife Site (CWS), the closest of which is Weybread Pits, located 780m south of the site. This 48.88 hectares (ha) site comprises disused gravel pits, now water-filled. It is separated from site by agricultural fields and roads.

3.3 Protected Species Records

There are 1056 records of protected and notable species listed within 2km of the site returned from NBIS and SBIS. Absence of records should not be taken as confirmation that a species is absent from the search area.

Table 1, provides a summary below:

Table 1 – Selected Protected and Notable Species Records

Common Name	Scientific Name	Biological Records Within 2Km	Date of Most Recent Record	Protective Status *
Amphibian				
Common Frog	Rana temporaria	YES	1998	WCA Sch 5 (Common. Documented decline up to 1970s, since then appears to have stabilized.)
Common Toad	Bufo bufo	YES	2011	UKBAP, WCA Sch 5, NERC
Great Crested Newt	Triturus cristatus	YES	2006	UKBAP, WCA Sch 5 + 6, HabsDir
Reptile				
Common Lizard	Zootoca vivipara	NO	-	UKBAP, WCA Sch 5, NERC
Slow Worm	Anguis fragilis	YES	2009	UKBAP, WCA Sch 5, NERC
Adder	Vipera berus	NO	-	UKBAP, WCA Sch 5, NERC
Grass Snake	Natrix natrix	YES	2011	UKBAP, WCA Sch 5, NERC
Mammal				
Badger	Meles meles	NO	-	PBA

Table 1 – Selected Protected and Notable Species Records

Common Name	Scientific Name	Biological Records Within 2Km	Date of Most Recent Record	Protective Status *
Otter	Lutra lutra	YES	2016	UKBAP, WCA Sch 5 + 6, HabsDir
Water Vole	Arvicola amphibius	YES	2004	UKBAP, WCA Sch 5, HabsDir
Hedgehog	Erinaceus europaeus	YES	2016	NERC, UKBAP, WCA Sch 6
Barbastelle Bat	Barbastella barbastellus	YES	2017	HabsDir, WCA Sch 5 + 6
Whiskered Bat	Myotis mystacinus	NO	-	HabsDir, WCA Sch 5 + 6
Natterers Bat	Myotis nattereri	YES	2017	HabsDir, WCA Sch 5 + 6
Serotine Bat	Eptesicus serotinus	YES	2017	HabsDir, WCA Sch 5 + 6
Noctule Bat	Nyctalus noctula	YES	2017	HabsDir, WCA Sch 5 +6, NERC, UKBAP
Soprano Pipistrelle	Pipistrellus pygmaeus	YES	2016	HabsDir, WCA Sch 5 + 6, NERC, UKBAP
Common Pipistrelle	Pipistrellus pipistrellus	YES	2016	HabsDir, WCA Sch 5 + 6
Brown Long-eared Bat	Plecotus auritus	YES	2017	HabsDir, WCA Sch 5 + 6, NERC, UKBAP
Daubentons bat	Myotis daubentonii	YES	2017	HabsDir, WCA Sch 5 + 6, NERC
Brown Hare	Lepus europaeus	YES	2016	UKBAP
Hazel Dormouse	Muscardinus avellanarius	NO	-	HabsDir, NERC, UKBAP, WCA Sch 5 + 6
Plants				
In total 2 species records of notable plants were provided from NBIS and SBIS. This includes WCA Sch 8, species (Hyacinthoides non-scripta) within 2km of the site. Other plant species include Shepherd's-needle (Scandix pecten-veneris), Dwarf Spurge (Euphorbia exigua) and Common Cudweed (Filago vulgaris).				
Invertebrates				
In total 18 records (10 species) of invertebrate were provided from NBIS and SBIS. Species include Norfolk Hawker (Anaciaeschna isoceles) WCA Sch 5. Other records include Sprawler moth (Asteroscopus sphinx) and Small Heath butterfly (Coenonympha pamphilus) both UKBAP species.				
Birds				
In total 774 records of bird (196 species) were provided from NBIS. A number of Schedule 1, species have been noted including: Kingfisher (Alcedo atthis), Hobby (Falco subbuteo), Firecrest (Regulus ignicapilla) and Barn Owl (Tyto alba).				
Notes: *WCA Sch 1 - Wildlife and Countryside Act (1981) Schedule 1. WCA Sch 5 - Wildlife and Countryside Act (1981) Schedule 5 (Killing, injuring and sale of certain species), WCA Sch 6 - Wildlife and Countryside Act (1981) Schedule 6 (Animals which may not be killed or taken by certain methods), WCA Sch 8 - Wildlife and Countryside Act (1981) Schedule 8 (Plants which are protected), UKBAP –UK Biodiversity Action Plan Species, NERC- Natural Environment and Rural Communities Act (2006) Section 41. Species and Habitats of Principal Importance. PBA - Protection of Badgers Act (1992). HabsDir- Conservation of Habitats and Species Directive (2010) Annex II, Annex IV. BoCC Red / Amber - Birds of Conservation Concern - Red or Amber listed.				

4. FIELD SURVEY RESULTS

An experienced surveyor from Geosphere Environmental Ltd carried out an initial appraisal of the site for protected species and habitats on the 16 October 2018. The weather conditions at the time of the survey were dry and sunny with an approximate temperature of 20°C.

The results of the Phase 1 Habitat Survey and Protected Species Scoping Survey are detailed below and annotated on Drawing ref. 3495,EC,AR,DS/001/Rev 0, attached in Appendix 3. Descriptions of the target notes (TN) and relevant photographs are included in Appendix 5.

4.1 Phase 1 Habitat Survey

The following habitat types were recorded within the survey area:

- Amenity grassland;
- Arable;
- Buildings and hardstanding;
- Defunct species-poor hedgerow;
- Dry ditch;
- Intact species-poor hedgerow;
- Intact species-rich hedgerow;
- Pond;
- Poor semi-improved grassland;
- Scattered trees;
- Tall Ruderal.

These habitats outlined above are discussed in more detail below.

4.1.1 Within the Development Zone

The majority of the site comprises arable fields (TN1) with dry ditches (TN2), hedgerows with trees and poor semi-improved grassland field margins. In the centre of the site are eight buildings (B1-B8), including a farm house (B1), garages (B3), associated hardstanding, amenity grassland and other farm buildings (B2, B4 to B8). A pond (P1) is located south of the central track through the farm and a field of poor semi-improved grassland is located north of this.

An intact species-rich hedgerow (TN3) runs parallel to the track through the site, ending at pond P1. This hedgerow was comprised of frequent English Elm (Ulmus procera), Hawthorn (Crataegus monogyna), Ivy (Hedera helix), Bramble (Rubus fruticosus agg.) and Dogwood (Cornus sanguinea) with Pedunculate Oak (Quercus robur), Field Maple (Acer campestre) and Ash (Fraxinus excelsior) rare throughout.

Intact species-poor hedgerows are located throughout the boundaries of the arable fields on site with the majority situated along the site boundary. This included frequent Blackthorn (Prunus spinosa) and Hawthorn with occasional Bramble and English Elm. There were also rare occurrences of Rose sp. (Rosa sp.).

There is a defunct species-poor hedgerow (TN4) situated at the south of the site, bordering the allotments and a small section in the centre of the southern half of the site. This was dominated by Hawthorn with occasional Ivy, Leyland Cypress (Cupressus x cuprocyparis leylandii) and Bramble.

Scattered Trees (TN5) are located throughout the hedgerows on site. The trees include abundant Ash and Pedunculate Oak with Spruce (Picea sp.), Sycamore (Acer pseudoplatanus), Crab Apple (Malus sylvestris), Horse Chestnut (Aesculus hippocastanum), Silver Birch (Betula pendula), Walnut (Juglans regia), Poplar sp. (Populus sp.) and Sweet Chestnut (Castanea sativa) rare throughout.

The field margins comprise poor semi-improved grassland (TN6), these field margins are mostly narrow (<1m wide), with some field margins in the northern half of the site being much wider (around 4m). There is also a small field of poor semi-improved grassland (TN6) at the west of the site, this grassland was recently cut to a short sward height prior to the survey. These areas of grassland comprised of abundant Cock's-foot (Dactylis glomerata), Perennial Rye-grass (Lolium perenne), Red Fescue (Festuca rubra) and False Oat-grass (Arrhenatherum elatius) with occasional Yorkshire Fog (Holcus lanatus) and rare occurences of Cows Parsley (Anthriscus sylvestris), Autumn Hawkbit (Scorzoneroides autumnalis), Dandelion (Taraxacum officinale agg.), White Clover (Trifolium repens), Cleavers (Galium aparine), Spear Thistle (Cirsium vulgare), Common Nettle (Urtica dioica), Bristly Ox-tongue (Helminthotheca echioides) and Smooth Sow-thistle (Sonchus oleraceus).

A small area of tall ruderal habitat is located at the western boundary adjacent to the residential housing development. This included frequent Great Willowherb (Epilobium hirsutum), Common Nettle, Cock's-foot, and False Oat-grass. Curled Dock (Rumex crispus), Timothy (Phleum pratense) and Smooth Sow-thistle were rare throughout.

4.2 Outside the Development Zone

Residential development is located to the west of the site, with agricultural land to the north. Along the southern and eastern boundary of the site runs the A143, a busy main road, with further agricultural land on the other side.

4.3 Protected Species Appraisal

4.3.1 Bats

The following 29 trees on/adjacent to site have suitable features that could support roosting bats, the location of these trees is shown on the Phase 1 Habitat Plan, Drawing ref. 3495,EC,AR,DS/001/Rev 0 in Appendix 3:

- 14 trees have Low Bat Roost Potential – T1, G7, T4, T7, T12, T15, T16, T17, G9, T18, T19, T37, T38, T39;
- 8 trees have Moderate Bat Roost Potential – T2, T5, T10, T14, T20, T35, T40, T41;
- 7 trees have High Bat Roost Potential – T9, T13, T24, T25, T26, T27, T36.

The majority of the buildings on site could not be accessed internally and as such the potential for roosting bats is based on external inspection only.

Building B1, is a residential property with an apex roof and interlocking tiles. The tiles, chimney edging, bricks and windows are all in good condition with no observable external features. Given that the internal roof space could not be accessed, this building is considered to have low potential for roosting bats. An internal inspection would be required to fully determine roost classification.

Building B2, is an L-shaped building with solid brick walls. The western half of the building has corrugated sheet roofing and the eastern half has interlocking tiles. There are multiple access/egress points within the tiled roof, brick walls and in the wooden eaves. Based on the external inspection, this building is considered to be of high suitability for roosting bats.

Building B3, is separated into an older open wooden garage, and concrete, flat roof garages fitted with doors. No gaps were noted within the walls or flat roof of the concrete garages. Although the older garage is partially open to the elements and light, there are multiple cracked and broken tiles within the roof. Given that the tiles are not backed by another material they offer limited potential for a small number of bats and therefore Building B3, is considered to be of low potential for roosting bats.

Buildings B4, is a metal framed farm building with asbestos sheet roofing and walls. This building is a lean to, used for storing machinery and hay, and is open to the elements. This building is not considered suitable for roosting bats.

Buildings B5, and B6, are also large metal framed farm buildings with good condition asbestos roofing and walls. These buildings are not considered to be suitable for roosting bats.

Building B7, has solid brick walls with an apex roof made of asbestos tiles and sheets. Small cracks within the brick walls and a slight gap in the sheeting were noted. Based on these external features this building is considered to have low potential for roosting bats.

Building B8, has an asbestos roof and asbestos cladding walls. No external gaps or features were noted on this building and therefore it is not considered suitable for roosting bats.

The hedgerows provide moderate suitability commuting and foraging habitat for bats. Should a roost be confirmed on site then the foraging habitat may be considered high suitability.

4.3.2 Reptiles

The hedgerows and grassland on site could provide habitat for reptiles, although the suitability of the habitats on site is limited due the majority of field margins being narrow. There is some connectivity to grazing fields to the north and as such there is potential for reptiles to be present on site.

4.3.3 Great Crested Newts

There are 14 ponds within 500m of the site. These ponds are referred to as ponds P1 to P13 on Drawing ref. 3495,EC,AR,DS/002/Rev 0 within Appendix 3. Ponds P6 to P13 were not accessible due to their location on private property.

A Habitat Suitability Index, (HSI), was undertaken to assess their suitability to support Great Crested Newts. A score between 0 and 1 is given; where 0 represents poor suitability and 1 represent excellent suitability. The results are provided in Appendix 6, and summarised in Table 2, overleaf:

Table 2 – HSI Scores of Ponds Accessed					
Pond	Distance from Site	Connected or Separated from Site	Pond Size (m^2)	HSI Score	Pond Suitability for Great Crested Newts
P1	On site	On site, connected	460	0.60	Average
P2	15m west	Adjacent to site, connected	1,100	0.75	Good
P3	40m west	Adjacent to site, connected	800	0.76	Good
P4	34m east	Separated by A143	245	0.45	Poor
P5	200m east	Separated by A143	170	0.56	Below Average

Pond P1, is located on site and although it was shallow at the time of the survey and lacked macrophyte cover, it has connectivity to hedgerows, poor semi-improved grassland and ponds P2, and P3. This pond has an HSI of 0.60 and is therefore considered to be of average suitability for breeding Great Crested Newts. The hedgerows and poor semi-improved grassland on site are considered suitable terrestrial habitat for Great Crested Newts.

Pond P2, and P3, are connected to the terrestrial habitats and pond P1, on the development site. Both these ponds are considered to be of good suitability for breeding Great Crested Newts.

Ponds P4 to P8, are separated from the development site by a busy main road (A143) and ponds P9 to P14, are separated by residential development and the urban area of Harleston. Therefore, any Great Crested Newts which may be using these ponds are unlikely to be found on site.

All other ponds which could not be accessed are either separated from site by sufficient barriers (busy road or residential development) or at a distance whereby any Great Crested Newts which may be using these ponds are unlikely to be found on site.

4.3.4 Birds

Table 3, overleaf, shows the species of birds that were noted on site or flying over the site, during the survey:

Table 3 – Birds Identified During the Survey	
Common Name	Scientific Name
Blackbird	Turdus merula
Black-headed Gull	Chroicocephalus ridibundus
Blue Tit	Parus caeruleus
Chaffinch	Fringilla coelebs
Goldfinch	Carduelis carduelis
Collared Dove	Streptopelia decaocto
House Sparrow	Passer domesticus
Jackdaw	Corvus monedula
Lesser Black-backed Gull	Larus fuscus
Pied Wagtail	Motacilla alba
Rook	Corvus frugilegus
Starling	Sturnus vulgaris
Woodpigeon	Columba palumbus

All species of bird noted on site are common and widespread.

4.3.5 Other Fauna

Feeding signs and droppings of Rabbit (Oryctolagus cuniculus) were noted along the central hedgerow. No signs of any other species were noted during the phase 1 habitat survey.

5. ECOLOGICAL EVALUATION, IMPACT ASSESSMENT

5.1 Nature Conservation Sites

There is one statutory designated nature conservation site within a 2km radius of the site. There are three non-statutory sites, designated nature conservation sites, identified by the desk study.

The development site does not contain any habitats which could support the important species associated with either the statutory or non-statutory sites.

It is considered unlikely, given the distance from the survey area and localised nature of the proposed development works, that the sites with statutory or non-statutory protection will be directly affected by any construction activity on the surveyed area.

It is understood that Local Authorities in the region are recently aiming to adopt a Recreational Disturbance Avoidance and Mitigation Strategy (RAMS), which requires developers to consider the impacts of development on European protected sites within the wider area. No sites were identified within a 13km radius.

5.2 Legally Protected and Notable Species

The ecological evaluation and impact assessment for protected species is detailed within Table 4, below:

Table 4 – Protected Species - Ecological Impact Assessment

Species	Biological Records Within 2km	Suitable Habitat Confirmed on Site	Impact Should Development without Appropriate Mitigation Take Place	Further Works Required
Bats (Roosting)	YES	YES - 29 trees on/adjacent to site have suitable features that could support roosting bats. Buildings B1, B3, and B7, are considered to be of low suitability and building B2, of high suitability for roosting bats. Some trees with low potential will be removed and all trees with moderate or high bat roost potential will likely be retained. However, it is unclear at this stage whether any construction works will occur within the root protection area of trees with high or moderate potential, or the extent of the lighting overspill. Building B7, will be removed during the development and given the close proximity of buildings B1 to B3, to the demolition area there is potential for these building to be indirectly impacted by lighting and noise during/post development.	Should bats be using the site for roosting, the removal or disturbance of this habitat could result in an impact of site to district significance.	YES – Further surveys will be required for Buildings B1, B2, B3, and B7, and any trees with bat roost potential which are likely to be impacted by development.
Bats (Foraging)	YES	YES -The hedgerows and grassland are of moderate suitability for foraging and commuting bats. It is considered likely that	Should bats be using the site for foraging and	YES – Further surveys are required to determine the number of bats and species

Table 4 – Protected Species - Ecological Impact Assessment				
Species	Biological Records Within 2km	Suitable Habitat Confirmed on Site	Impact Should Development without Appropriate Mitigation Take Place	Further Works Required
		much of these habitats will be retained. However, access points will be inserted within the northern and western boundary hedgerows and the potential indirect impacts of development are unknown.	commuting, the removal or disturbance of foraging habitat could result in an impact of site to district significance.	using the site, in order to assess the potential indirect impacts of development and potential enhancement features to incorporate into development design.
Great Crested Newt	YES	YES - Pond P1, is located on site and is considered to be of average suitability for breeding Great Crested Newts. Pond P2, and P3, are connected to the development site and P1. Both these ponds are considered to be of good suitability for breeding Great Crested Newts.	Should Great Crested Newts be using the site then the development could cause an impact of site to district significance.	YES – Further surveys required
Otter & Water Vole	YES	NO -The River Waveney is situated 750m south of the development and therefore Otter and Water Vole are not considered to be a constraint for this development.	N/A	NO
Hazel Dormouse	NO	NO - The majority of the hedgerows on site are considered to be species poor and lack connectivity to any woodland stands. Therefore, Hazel Dormouse are not considered to be a constraint for this development.	N/A	NO
Badger	NO	YES - The grassland could be considered suitable foraging habitat for this species; however, no Badger setts or foraging signs were identified within the site during the habitat survey.	N/A	NO
Birds	YES	YES - The hedgerows, trees and buildings on site offer value to breeding birds, providing suitable nesting and foraging grounds for common passerine birds and are considered important on a site scale. It is considered likely that much of these habitats will be retained.	Possible negative impact of site significance.	YES – Clearance to be timed outside of the breeding season or removed under clerk of works supervision.
Reptiles	YES	YES - The hedgerows and grassland on site could provide habitat for reptiles. There is some connectivity to grazing fields north of the site, and as such there is potential for reptiles to be present on site.	Possible negative impact of local significance.	YES – Further surveys required
Hedgehog	YES	YES - The hedgerows and grassland are considered suitable for hedgehogs.	The majority of the hedgerows will be retained within the proposed development. This habitat along with the additional	NO

Table 4 – Protected Species - Ecological Impact Assessment				
Species	Biological Records Within 2km	Suitable Habitat Confirmed on Site	Impact Should Development without Appropriate Mitigation Take Place	Further Works Required
			planting and public open space will benefit hedgehogs.	
Invertebrates	YES	YES - The site is only considered suitable for common species of invertebrate.	N/A	NO
Notable Plants	YES	NO - No notable plant species were noted within the phase 1 habitat survey.	N/A	NO

5.3 Habitats on Site

Habitats that may be affected by the proposed works include those which may support legally protected species, particularly the poor semi-improved grassland, hedgerows, trees, pond, buildings B1, B2, B3, and B7. Depending on the results of further protected species surveys, the value of these habitats may increase further. These habitats have variable significance and can be confirmed through further specific surveys.

6. ECOLOGICAL CONSTRAINTS AND RECOMMENDATIONS FOR MITIGATION AND ENHANCEMENT OPPORTUNITIES

6.1 Ecological Constraints

The constraints to development will be the removal or disturbance of the poor semi-improved grassland, hedgerows, trees, pond, buildings B1, B2, B3, and B7, which could impact either roosting bats, foraging and commuting bats, breeding birds, reptiles or Great Crested Newts.

6.2 Recommendations

In general, if a habitat survey indicates potential habitat for legally protected species on the site which will be affected by the development, further species-specific surveys should be undertaken to determine if these species are present. If they are not carried out, the developer and/or subcontractors could be found liable for intentional, deliberate or reckless offenses with respect to wildlife.

6.2.1 Habitats

Any hedgerows or trees to be retained should be protected during the works. These protection measures should be implemented according to BS 5837: 2012 'trees in relation to design, demolition and construction' (ref. R.11).

6.2.2 Bats: Roosting

29 trees on/adjacent to site have suitable features that could support roosting bats. Two trees with low potential (G9 and T18) are likely to be removed.

Prior to the removal of trees with low bat roost potential an Arborist should be informed of the classification of the trees in terms of bat roost risk and check any features within the trees, to ensure the absence of roosting bats prior to pruning or felling. Precautionary measures such as careful cutting and lowering of limbs should be followed. Care and vigilance should be exercised by site contractors during tree works. In the unlikely event that bats are found, all works should stop and Natural England or a licensed bat ecologist should be informed immediately. Work should not recommence without approval or potential necessary licenses.

All trees with moderate or high bat roost potential will likely be retained within the development. However, it is unclear at this stage whether the trees will be impacted by the development. Impacts include any construction works within the root protection area of the tree, as defined in BS 5837:2012 (ref. R.11) and lighting overspill onto/adjacent to the trees. Should the trees be likely to be impacted by the development, then activity surveys will be required. Trees with moderate potential require two separate survey visits and those with high potential require three, from May to September.

Building B7, will be removed during development and buildings B1 to B3, will be retained. However, given the close proximity of buildings B1 to B3, to the demolition area and the potential indirect impacts from noise and lighting, during and post development, it is recommended that surveys are carried out on all buildings with bat roost potential to determine presence/absence. Buildings will low potential for roosting bats (B1, B3, and B7,) require one survey visit, and buildings with high potential for roosting bats (B2,) require three survey visits, from May to September.

6.2.3 Bats: Foraging

The hedgerows and grassland on site were identified to provide foraging and commuting habitat of moderate suitability for bats. It is considered likely that much of these habitats will be retained and a large amount of additional planting will be incorporated into the proposed development. However, access points will be inserted within the northern and western boundary hedgerows and the potential indirect impacts of the development are unknown.

As such further surveys are required to determine the number of bats and species using the site, in order to assess the potential indirect impacts of development and potential enhancement features to incorporate into development design.

Based on the proposed development it is recommended that a minimum of three surveys be undertaken from May to September. Depending on the findings more surveys may be required.

6.2.4 Great Crested Newts

Ponds P1, P2, and P3, are all considered suitable for breeding Great Crested Newts and are either on site or connected to the terrestrial habitats (hedgerows and poor semi-improved grassland) on site, therefore further surveys are required.

The survey of the ponds can be undertaken using eDNA techniques where water samples are analysed to show presence or absence or by using traditional methods of survey, which include bottle trapping, torch light survey and egg searching of marginal vegetation.

eDNA sampling can only be undertaken between 15 April and 30 June. It should be noted that, where an eDNA sample is taken, and the results indicate presence of GCN, then this must be followed by the more traditional survey effort involving six survey visits to be undertaken between mid - March and mid-June.

EDNA sampling should be taken as early in the season as possible in order to accommodate the traditional surveys visits if required.

6.2.5 Reptiles

The poor semi-improved grassland and hedgerows on site are considered suitable for reptiles. Although connectivity to the wider landscape is limited there is connectivity to grazing fields north of the site and as such there is potential for reptiles to be present on site. Therefore, a survey is required to determine presence.

Amongst reptiles, there is only a licensing system for Smooth Snake and Sand Lizard. However, it is strongly recommended that surveys and the specification of any mitigation measures, if necessary, are carried out by a suitably qualified ecologist. Surveys for reptiles can only be undertaken between April and October under suitable weather conditions.

6.2.6 Breeding Birds

The hedgerows, trees and buildings on site offer value to breeding birds, providing suitable nesting and foraging grounds for common passerine birds.

To ensure that no offences occur under the WCA, it is recommended that any vegetation clearance work or building demolition work is undertaken outside of the bird nesting season. The bird-nesting season is generally regarded to extend between March and August inclusive, (weather dependent).

If it is not possible to undertake clearance works outside of the breeding bird season, a suitably qualified ecologist should be employed to determine if nesting birds are using the site prior to works commencing, to avoid negative impact on protected species. Any active nests that are found would need to be provided with a 10-metre buffer which would have to be left until the young had fledged, (typically four weeks from eggs being laid for the garden and woodland species likely to be present). Clearance works within the area can recommence only once the nest is no longer in use.

6.3 Biodiversity Enhancement Opportunities

The following has been recommended for consideration within the final development Scheme:

- Any plants considered within the final development should ideally be native and considered beneficial to wildlife. Fruit/berry producing trees could be considered in order to provide a local food source for birds;
- Log piles for invertebrates;
- Nest boxes or nest bricks for common passerine birds;
- Holes in the bottom of garden fences should be included to provide habitat connectivity for foraging hedgehogs.

7. CONCLUSIONS

The proposed development will not adversely affect any statutory or non-statutory designated nature conservation sites.

Habitats that may be affected by the proposed works include those which may support legally protected species, particularly the poor semi-improved grassland, hedgerows, trees, pond, buildings B1, B2, B3, and B7. Depending on the results of further protected species surveys, the value of these habitats may increase further. These habitats have variable significance and can be confirmed through further specific surveys.

The site is not considered suitable for Otter, Water Vole and Hazel Dormouse.

There are suitable features, within the area to be affected by the proposed development, which may provide habitat for protected species, in particular:

- Roosting Bats: 29 trees on/adjacent to site, as well as building B1, B2, B3, and B7, have suitable features that could support roosting bats;
- Foraging Bats: The hedgerows, trees and grassland provide moderate suitability foraging and commuting habitat for bats;
- GCN: Ponds P1, P2, and P3, are all considered suitable for breeding Great Crested Newts and are either on site or connected to the terrestrial habitats (hedgerows and poor semi-improved grassland) on site;
- Birds: The hedgerows and trees, as well as the buildings within the site, provide suitable nesting habitat for breeding birds during the breeding season;
- Reptiles: The hedgerows and grassland on site could provide habitat for reptiles.

The constraints to development will be the removal or disturbance of the poor semi-improved grassland, hedgerows, trees, pond, buildings B1, B2, B3, and B7, which could impact either roosting bats, foraging and commuting bats, breeding birds, reptiles or Great Crested Newts. The recommendations within Section 6, of this report should be adhered to, to reduce the impact on protected species.

APPENDICES

APPENDIX 1 – REPORT LIMITATIONS AND CONDITIONS

This report was prepared only for our client and is not intended to be relied on by any other party.

Any limitations associated with the report will be stated. The consequences of any limitations, findings and/or recommendations in the report are made clear in line with CIEEM professional conduct guidelines and British industry standards, (refs. R.1 and R.2).

The Executive Summary, Conclusions and Recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon until considered in the context of the whole report.

Interpretations and recommendations contained in the report represent our professional opinions, which were arrived at in accordance with currently accepted industry practices at the time of reporting and based upon current legislation in force at that time.

This report is prepared and written in the context of the proposals stated in the introduction to this report and should not be used in a differing context. Furthermore, new information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to us for re-assessment and, if necessary, re-appraisal.

Scientific survey data will be shared with local biological records centre in accordance with the CIEEM professional code of conduct.

The scoping survey does not assess the presence or absence of a species, but is used to assess the potential for habitat to support them.

This survey does not constitute an invasive species survey and should not be treated as such.

Geosphere Environmental Ltd may not be aware of information that could be held by other organisations or individuals, and it is always possible for features of nature conservation interest to be unrecorded during surveys.

APPENDIX 2 – REFERENCES

R.1. CIEEM (2013) Guidelines for Preliminary Ecological Appraisal (GPEA).

R.2. BSI (2013) BS 42020:2013 Biodiversity – Code of practice for planning and development. BSI Standards Limited 2013.

R.3. Ministry of Housing, Communities and Local Government (MHCLG) (July 2018) National Planning Policy Framework (NPPF).

R.4. ODPM (2005) Government Circular: Biodiversity and Geological Conservation – statutory obligations and their impact within the planning system.

R.5. JNCC, (2010). 'Handbook for Phase I Habitat Survey: A technique for environmental audit' (reprint). Joint Nature Conservation Committee, Peterborough.

R.6. Stace, C. A. (2010). New Flora of the British Isles (third edition), Cambridge University Press.

R.7. Magic (accessed October 2018). Site Check Report. www.magic.gov.uk.

R.8. Goldsmith, B. (1991). Monitoring for Conservation and Ecology, Chapman & Hall.

R.9. 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

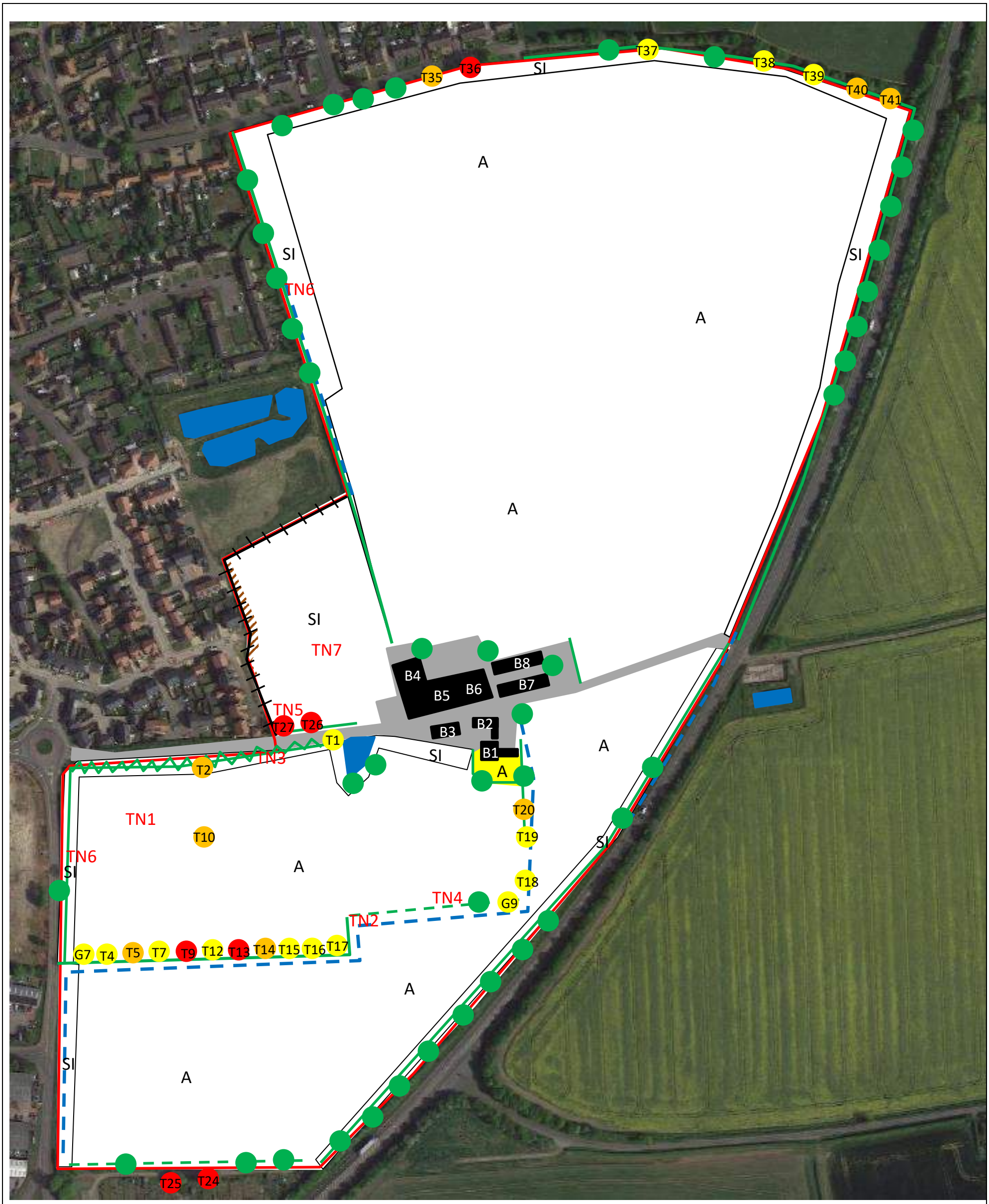
R.10. CIEEM, (2016). Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (Second edition dated January 2016).

R.11. BS 5837: (2012), 'Trees in Relation to Design, Demolition and Construction'.

APPENDIX 3 – DRAWINGS

Phase 1 Habitat Survey Plan – Drawing ref. 3495,EC,AR,DS/001/Rev 0

Pond Location Plan – Drawing ref. 3495,EC,AR,DS/002/Rev 0



Legend:

Site Boundary	B1 Building B1	A Amenity Grassland	Dry Ditch	Fence	
Scattered Trees	Hardstanding	SI Poor Semi-improved Grassland	Tree with Low Bat Roost Potential	TN1 Target Note 1	
Pond	A Arable	Intact Species-poor Hedgerow	Tree with Moderate Bat Roost Potential		
Tall Ruderal	Intact Species-Rich Hedgerow	Defunct Species-poor Hedgerow	Tree with High Bat Roost Potential		

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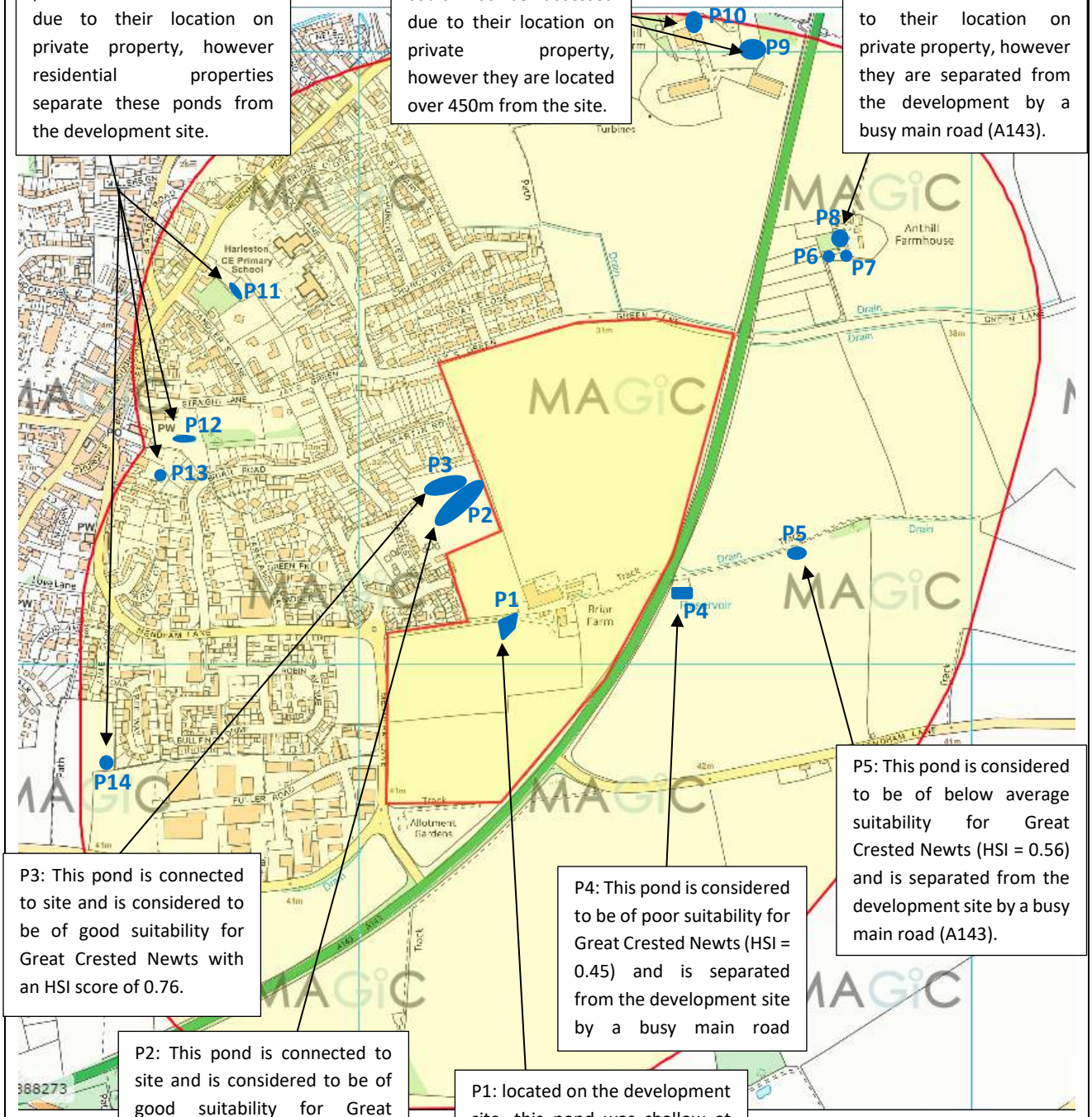
SITE	TITLE	PROJECT NO.	DRAWING NO.	DATE
Briar Farm: Land Off Mendham Lane, Harleston, Norfolk, IP20 9DW	Phase 1 Habitat Plan **CLIENT** M Scott Properties Ltd	3495,EC,AR,DS **DRAWN BY** ZK	001 / Rev 0 **CHECKED** KL	October 2018 **SCALE** Not to scale

P11, P12, P13, & P14: These ponds could not be accessed due to their location on private property, however residential properties separate these ponds from the development site.

P9, & P10: These ponds could not be accessed due to their location on private property, however they are located over 450m from the site.

P6, P7, & P8: These ponds could not be accessed due to their location on private property, however they are separated from the development by a busy main road (A143).



P3: This pond is connected to site and is considered to be of good suitability for Great Crested Newts with an HSI score of 0.76.

P2: This pond is connected to site and is considered to be of good suitability for Great Crested Newts with an HSI score of 0.75.

P1: located on the development site, this pond was shallow at the time of the survey and lacked macrophyte cover. This pond has an average HSI score of 0.60.

P4: This pond is considered to be of poor suitability for Great Crested Newts (HSI = 0.45) and is separated from the development site by a busy main road

P5: This pond is considered to be of below average suitability for Great Crested Newts (HSI = 0.56) and is separated from the development site by a busy main road (A143).

Site Boundary

500m Buffer

Pond

P1 Pond P1

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SITE	TITLE	PROJECT NO.	DRAWING NO.	DATE
Briar Farm: Land Off Mendham Lane, Harleston, Norfolk, IP20 9DW	Pond Location Plan **CLIENT** M Scott Properties Ltd	3495,EC,AR,DS **DRAWN BY** ZK	002/ Rev 0 **CHECKED** KL	October 2018 **SCALE** Not to scale

APPENDIX 4 – DESK STUDY DATA

Site Check Report Report generated on Fri Oct 12 2018
You selected the location: Centroid Grid Ref: TM25328310
The following features have been found in your search area:

Sites of Special Scientific Interest (England)

Name	Gawdyhall Big Wood, Harleston SSSI
Reference	1001899
Natural England Contact	EMILY SWAN
Natural England Phone Number	0845 600 3078
Hectares	29.82
Citation	1004030
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1004030

Areas of Outstanding Natural Beauty (England)
No Features found

Local Nature Reserves (England)
No Features found

National Nature Reserves (England)
No Features found

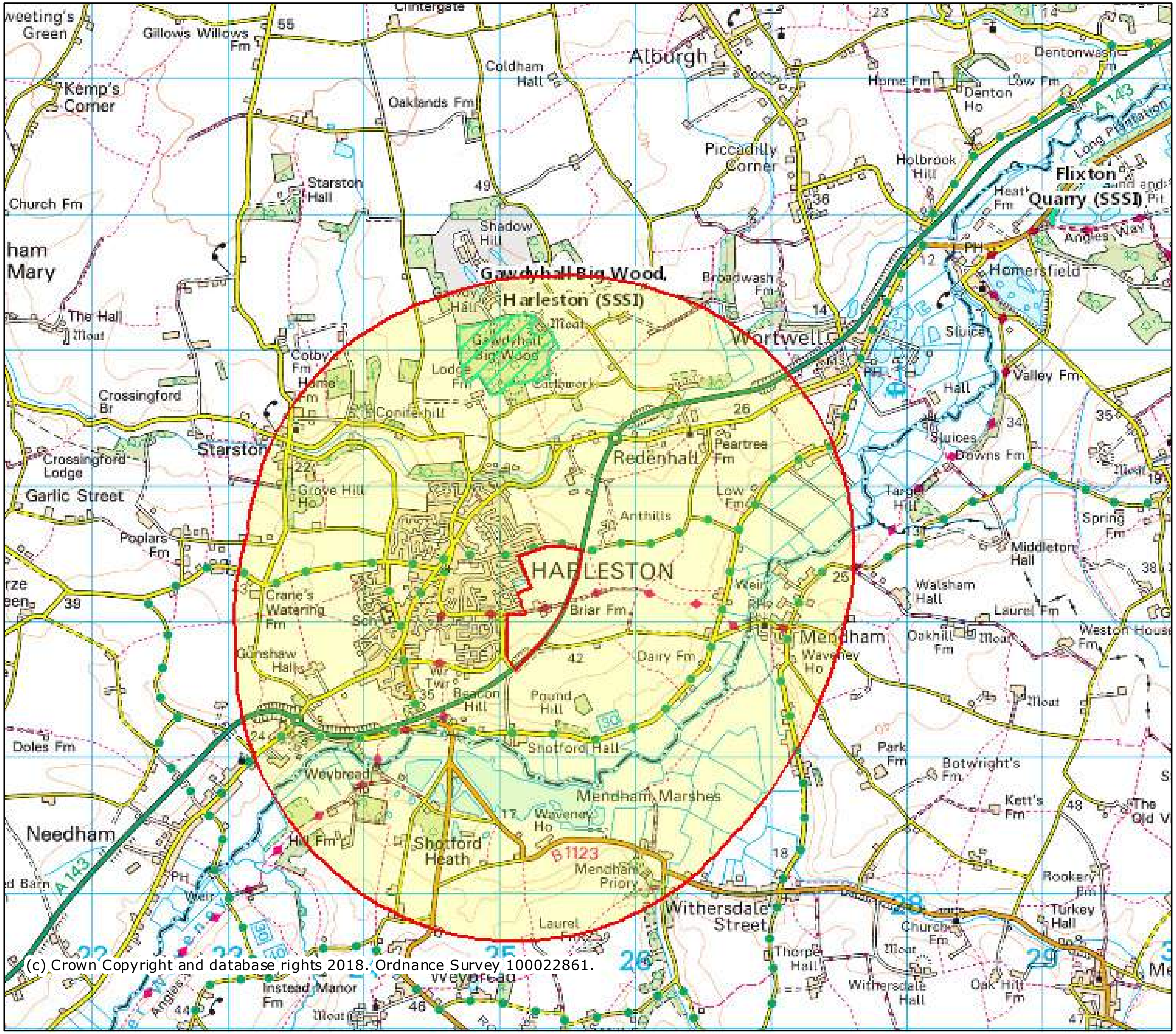
Ramsar Sites (England)
No Features found

Special Areas of Conservation (England)
No Features found

Special Protection Areas (England)
No Features found

MAGIC

Land at Briar Farm, Harleston



Legend

- Local Nature Reserves (England)
- National Nature Reserves (England)
- Ramsar Sites (England)
- Sites of Special Scientific Interest (England)
- Special Areas of Conservation (England)
- Special Protection Areas (England)

Projection = OSGB36
xmin = 614800
ymin = 278200
xmax = 636500
ymax = 289300

0 0.8 1.6
km

Map produced by MAGIC on 12 October, 2018.

APPENDIX 5 – TARGET NOTES AND RELEVANT PHOTOGRAPHS

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Target Note 1 The majority of the site is comprised of arable fields, which are considered to be of low ecological value.

Target Note 2 A few drainage ditches are located at the field margins on site, although the ditches were dry during the survey they are likely to be wet after periods of heavy/prolonged rainfall.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Target Note 3

An intact species-rich hedgerow is located parallel to the track through the site. This hedgerow is considered suitable for foraging and commuting bats, breeding birds, overwintering reptiles and amphibians.

Target Note 4

Defunct species-poor hedgerows are located throughout the boundaries of the arable fields on site. These hedgerows are considered suitable for foraging and commuting bats, breeding birds, overwintering reptiles and amphibians.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Target Note 5

Scattered Trees are located throughout the hedgerows on site. A large number of these trees are mature and considered suitable for roosting bats. These trees are also important for breeding birds and foraging bats.

Target Note 6

Poor semi-improved grassland field margins are located on site, these vary from narrow (<1m wide) to wide (around 4m). These field margins are considered suitable for reptiles and are considered suitable terrestrial habitat for Great Crested Newts.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Target Note 7	A small field of poor semi-improved grassland is located at the west of the site. This grassland was cut to a short sward height prior to the survey, however it is unknown how often this grassland is cut. This grassland is considered suitable for reptiles and is considered suitable terrestrial habitat for Great Crested Newts.

Building B1	Building B1, is a residential property with an apex roof and interlocking tiles. The tiles, chimney edging, bricks and windows are all in good condition with no observable external features. Given that the internal roof space could not be accessed, this building is considered to have low potential for roosting bats.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Building B2	Building B2, is an L-shaped building with solid brick walls. The western half of the building has corrugated sheet roofing and the eastern half has interlocking tiles. There are multiple access/egress points within the tiled roof, brick walls and in the wooden eaves. Based on the external inspection, this building is considered to be of high suitability for roosting bats.

Building B3	Building B3, is separated into an older open wooden garage, and concrete, flat roof garages fitted with doors. No gaps were noted within the walls or flat roof of the concrete garages. Although the older garage is partially open to the elements and light, there are multiple cracked and broken tiles within the roof. Given that the tiles are not backed by another material they offer limited potential for a small number of bats and therefore Building B3, is considered to be of low potential for roosting bats.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Building B4	Buildings B4, is a metal framed farm building with asbestos sheet roofing and walls. This building is a lean to, used for storing machinery and hay, and is open to the elements. This building is not considered suitable for roosting bats.

Building B5	Building B5, is a large metal framed farm building with good condition asbestos roofing and walls and is not considered to be suitable for roosting bats.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Building B6	Building B6, is also a large metal framed farm building with good condition asbestos roofing and walls and is not considered to be suitable for roosting bats.

Building B7	Building B7, has solid brick walls with an apex roof made of asbestos tiles and sheets. Small cracks within the brick walls and a slight gap in the sheeting were noted. Based on these external features this building is considered to have low potential for roosting bats.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Pond P1	This pond is located on site and although it was shallow at the time of the survey and lacked macrophyte cover, it has connectivity to hedgerows, poor semi-improved grassland and ponds P2, and P3. This pond has an HSI of 0.60 and is therefore considered to be of average suitability for breeding Great Crested Newts.

Pond P2	This pond has an HSI of 0.75 and is considered to be of good suitability for breeding Great Crested Newts.

ECOLOGICAL TARGET NOTES AND RELEVANT PHOTOGRAPHS RELATING TO EXTENDED PHASE I HABITAT SURVEY

Pond P4	This pond has an HSI of 0.45 and is considered to be of poor suitability for breeding Great Crested Newts due to the lack of suitable terrestrial habitat surrounding the pond.

Pond P5	This pond has an HSI of 0.56 and is considered to be of below average suitability for breeding Great Crested Newts.

APPENDIX 6 – HABITAT SUITABILITY INDEX

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HABITAT SUITABILITY INDEX: ASSESSING A PONDS SUITABILITY TO SUPPORT GREAT CRESTED NEWTS

Project No:	3495,EC,AR,DS
Project Name:	Briar Farm: Land off Mendham Lane, Harleston, Norfolk
Date:	16-Oct-18
Weather:	Dry and sunny with an approximate temperature of 20°C

Pond Ref:	SI1	SI2	SI3	SI4	SI5	SI6	SI7	SI8	SI9	SI10	HSI	Suitability
	Location	Pond Area	Pond Drying	Water quality	Shade	Fowl	Fish	Ponds	Terr'l Habitat	Macrophytes		
P1	1	0.9	0.5	0.33	1	0.67	1	0.65	0.33	0.3	0.60	Average
P2	1	0.9	0.9	0.67	1	1	0.67	0.65	0.33	0.7	0.75	Good
P3	1	0.98	0.9	0.67	1	1	0.67	0.65	0.33	0.8	0.76	Good
P4	1	0.44	1	0.33	1	1	1	0.8	0.01	0.3	0.45	Poor
P5	1	0.2	1	0.67	0.6	0.67	0.67	0.8	0.33	0.3	0.56	Below Average

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

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