Garrett Hall Farm, Garrett Lane, Tyldesley, M29 7EY

ECOLOGICAL SURVEY AND ASSESSMENT (including a Licensed Bat Survey)

July 2018

[ERAP (Consultant Ecologists) Ltd ref: 2018-109]

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Document Control

Survey Type:	Surveyors ¹	Survey Date(s)		
Phase 1 Habitat Survey	Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM	23 rd April 2018		
Daylight bat survey	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM	9 th May 2018		
Bat activity surveys	Amy Sharples and assistants	5 th and 28 th June 2018		
Great crested newt eDNA	Amy Sharples and Victoria Burrows	9 th May 2018		
survey				
Water vole surveys	Chris Swindells B.Sc. (Hons)	12 th May 2018		
Reporting	Personnel	Date		
Author	Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM	18 th July 2018		
	Ecologist			
Signature(s)	A. Sherples			
Checked by	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM	20 th July 2018		
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Licence reference numbers

Bats

Victoria Burrows, Natural England Class Survey Licence (bats, Level 2) Registration Number 2015-10390-CLS-CLS;

Great crested newt

Amy Sharples Natural England Class Survey Licence (Level 2) Registration Number 2015-16679-CLS-CLS Victoria Burrows Natural England Class Survey Licence (Level 1) Registration Number 2015-16651-CLS-CLS

Barn Owl

Victoria Burrows Natural England Class Survey Licence Registration Number CL29/00061



SUMMARY

- i. This Ecological Appraisal presents the ecological, biodiversity and nature conservation status of the land at Garrett Hall Farm, Garrett Lane, Tyldesley, M29 7EY. The appraisal was requested in connection with proposals to redevelop the site to housing.
- The appraisal presents the results of a desktop study, extended Phase 1 Habitat Survey, a daylight licensed bat survey, bat activity surveys, great crested newt eDNA survey and a water vole survey carried out between April and June 2018. The scope of survey undertaken is appropriate to identify potential ecological constraints, the remit of mitigation required and opportunities for biodiversity associated with the development proposals.
- iii. The site comprises a farm house and associated outbuildings and hard standing, semi-improved grassland, tall-herb vegetation, scrub, ponds, a ditch and a section of Ellenor Brook.
- iv. The proposals will have no adverse effect on statutory or non-statutory designated sites for nature conservation.
- v. None of the habitats within the site are of significant interest in terms of their plant species composition; only common and widespread plant species were recorded. None of the habitats present are semi-natural habitat. The National Vegetation Classification (NVC) communities present are typical of the geographical area and site conditions.
- vi. Hedgerows 1 to 3 are Priority Habitat, but do not qualify as 'important' in accordance with *The Hedgerow Regulations* 1997 wildlife and landscape criteria. Recommendations for the protection of hedgerows and compensatory planting to be implemented if the removal of a section of hedgerow is unavoidable are presented at **Sections 5.2** and **5.8**.
- vii. Ellenor Brook is a main river (as defined by the Environment Agency). The protection of Ellenor Brook and its associated wildlife corridor value will be achieved by the proposals, as described at **Section 5.2**.
- viii. Ponds 1 and 2 do not qualify as Priority Habitat; both ponds are of site value as they contribute to the diversity of habitats within the site and Pond 1 is suitable for use by amphibians. It is recommended that Ponds 1 and 2 are retained and enhanced as part of the redevelopment proposals. The great crested newt eDNA samples taken at Ponds 1 and 2 were returned as negative. Reasonable Avoidance Measures for the protection of other amphibian species will be implemented and are described at **Section 5.7**.
- ix. The scrub in the western area of the site is listed on the Deciduous Woodland Priority Habitat Inventory for England. Recommendations for the retention and protection of the scrub are presented at **Section 5.2**.
- x. Invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) namely Japanese Knotweed, Indian Balsam and Giant Hogweed were detected. It is an offence to cause the spread of these species in the wild. Guidance on the control and management of these species is described in the report (**Section 5.4**).
- xi. Buildings 1 and 2 are assessed to be of moderate and low suitability for use by roosting bats. Appropriate survey effort in accordance with recognised survey guidelines has been undertaken to determine the status of roosting bats at the site. No bat emergence or re-entry activity was detected during the two dawn re-entry surveys. Demolition works may proceed in accordance with a precautionary method statement, refer to **Section 5.5**. If works at Buildings 1 and 2 has not commenced before May 2019 updated activity surveys are recommended (**Section 5.5**). All other buildings are assessed to be of negligible suitability for use by roosting bats.
- xii. Building 1 is used by nesting house sparrow, and the scrub and Bramble scrub are of site value as they contribute to the diversity of habitats within the site and are suitable for use by nesting birds. Mandatory actions to protect nesting birds during site clearance and measures to provide compensatory opportunities for nesting birds are recommended and will be achieved by the proposals, refer to **Sections 5.6** and **5.8**.
- xiii. The redevelopment of the site to housing can be achieved with no significant adverse effect on designated sites for nature conservation, ecologically valuable habitats and protected species.
- xiv. Actions to ensure compliance with wildlife legislation and best practice will be implemented and are described in **Section 5.0**. Measures to achieve a net gain for biodiversity in accordance with the development proposals are specified in **Section 5.0** and are entirely feasible to achieve compliance with the NPPF and relevant local planning policy.



1.0 INTRODUCTION

1.1 Background and Rationale

- 1.1.1 ERAP (Consultant Ecologists) Ltd was commissioned by Peel Investments (North) Ltd to carry out an ecological appraisal of Garrett Hall Farm, Garrett Lane, Tyldesley, M29 7EY, hereafter referred to as the 'site'. The Ordnance Survey (OS) grid reference at the centre of the site is SD 7070 0159.
- 1.1.2 The appraisal was requested in connection with a planning application to redevelop the site to housing.

1.2 Scope of Works

- 1.2.1 The scope of ecological works undertaken between April and June 2018 comprised:
 - a. A desktop study and data search for known ecological information at the site and the local area;
 - b. An Extended Phase 1 Habitat Survey and assessment;
 - c. Assessment of the ecological value of the habitats within the site with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria, as presented in *A Nature Conservation Review* (Ratcliffe, 1977);
 - d. Survey and assessment of all habitats for statutorily protected species and other wildlife including badger (*Meles meles*), barn owl (*Tyto alba*), great crested newt (*Triturus cristatus*), water vole (*Arvicola amphibius*), bird species and reptiles;
 - e. A licensed bat survey of the buildings and trees followed by the relevant scope of bat activity surveys;
 - f. The identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and
 - g. The identification of any further surveys or precautionary actions that may be required prior to the commencement of any development activities.
- 1.2.2 All measurements within this report are approximate only, and have been either estimated whilst on site or calculated using mapping software (QGIS) or internet-based mapping services such as MAGiC and Google Earth.

2.0 METHOD OF SURVEY

2.1 Desktop Study

- 2.1.1 The following sources of information and ecological records were consulted:
 - a. MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
 - b. Greater Manchester Ecology Unit; and
 - c. The Greater Manchester Biodiversity Action Plan (BAP).

2.2 Vegetation and Habitats

- 2.2.1 An Extended Phase 1 Habitat Survey of the site was carried out by Amy Sharples B.Sc. (Hons) M.Sc. GradCIEEM on 23rd April 2018. The weather was overcast with a light breeze (Beaufort Scale 2) and an air temperature of 14°C. The conditions and time of year were favourable for the ecological survey.
- 2.2.2 A habitat and vegetation map was produced for the site and the immediate surrounding area at a scale of 1:2000 (refer to **Figure 2**). The mapping is based on the Joint Nature Conservation Committee Phase 1



Habitat Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.

- 2.2.3 The plant species within the site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater precision.
- 2.2.4 Stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and is a reliable framework for nature conservation and land-use planning.
- 2.2.5 Hedgerows were assessed in accordance with *The Hedgerows Regulations 1997* Wildlife and Landscape Criteria (H.M.S.O., 1997).
- 2.2.6 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).
- 2.2.7 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

2.3 Animal Life

Badger

- 2.3.1 A search for badger activity was carried out. The survey area covered the site (as annotated on **Figure 1**) and extended to accessible land within a radius of 50 metres from the site boundary. Private gardens were excluded from the survey.
- 2.3.2 Surveys were conducted in accordance with guidance presented within *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).
- 2.3.3 The following signs of badger activity were searched for:
 - a. Sett entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;
 - b. Large spoil heaps outside sett entrances;
 - c. Bedding outside sett entrances;
 - d. Badger footprints;
 - e. Badger paths;
 - f. Latrines;
 - g. Badger hairs on fences or bushes;
 - h. Scratching posts; and
 - i. Signs of digging for food.
- 2.3.4 Habitats within and surrounding the site were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).



Bat Species

Daylight Survey

Survey Personnel

- 2.3.5 The site was assessed for its suitability to support roosting bats by Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM on 9th May 2018. The weather was dry, sunny and calm (Beaufort Scale 0) with an air temperature of 12°C at 08:00 rising to 15°C. Victoria holds a Natural England Class Survey Licence WML CL18 (Bat Survey Level 2), Registration Number 2015-10390-CLS-CLS.
- 2.3.6 The surveyor's qualifications and experience meet the criteria as defined in the *Technical Guidance Series Competencies for Species Survey: Bats* (CIEEM, 2013).

Buildings

- 2.3.7 The survey was carried out in accordance with standard methodology including the *Bat Mitigation Guidelines* (Mitchell-Jones, 2004), the *Bat Workers' Manual 3rd Edition* (Mitchell-Jones & Mcleish, 2004) and *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins, J. (ed), 2016).
- 2.3.8 An inspection of the external surfaces, walls and roofs of the buildings was carried out to find potential bat roosting habitat or accesses into internal areas where roosts may be present. Searches for evidence of bat presence in the form of droppings, urine stains, feeding signs, grease marks and other evidence were also carried out.
- 2.3.9 The internal survey involved an examination of the accessible internal areas (including roof voids) to find roosting bats or evidence of past use of the buildings by bats such as droppings and prey remains.
- 2.3.10 A list of equipment used is detailed at **Table 2.1**, below:

Table 2.1: Survey Equipment Used During Daylight Bat Survey

Ladders
LED Lenser P14 torch
Clulite CB2 hand lamps
Canon Ixus digital camera
8x20 binoculars
Ridgid Micro Inspection Camera Borescope CA-300

2.3.11 The suitability of each building has been assessed in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn),* (Collins, J. (ed), 2016), taking into account any presence of gaps suitable for access by bats, features suitable for use by roosting bats within the building (including crevice dwelling and species which can roost in the open in roof voids), and the suitability of the surrounding habitats for use by foraging and commuting bats.

Trees

- 2.3.12 A preliminary assessment of the trees within the site was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures were required.
- 2.3.13 Trees were assessed from the ground using binoculars and a high-powered torch. Each tree was searched for the presence of the following features:

Woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed platey bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy (Hedera helix) with stem diameters in excess of 50mm and bat, bird or dormouse (Muscardinus avellanarius) boxes.



- 2.3.14 Terms used to describe any features present follow (where possible) those outlined and described in *Bat Tree Habitat Key, 2nd Edition* (Andrews, H (ed), 2013).
- 2.3.15 The requirement for further presence / absence surveys at each tree was then considered.

Habitat Assessment for Commuting / Foraging Bats

2.3.16 Habitats within and adjacent to the site were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn),* (Collins, J. (ed), 2016). Reference has been made using the following categories and descriptions / examples, presented below.

Table 2.2: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.	
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.	Habitat that is linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Presence / Absence Surveys: Dawn Re-entry Surveys

- 2.3.17 Two dawn re-entry surveys were conducted at the Buildings 1 and 2 in June 2018.
- 2.3.18 Six surveyors, experienced in conducting bat surveys, were positioned at suitable locations to maximise the coverage of Buildings 1 and 2 to determine any entry into the building by roosting bats. Heterodyne detectors were used to determine any bat detected to species. Recording bat detectors units¹ were also used to record and analyse echolocation calls after the survey using AnalookW bat call analysis software.
- 2.3.19 The dawn re-entry surveys commenced approximately two hours before sunrise and ended at sunrise, provided all bat activity had ceased by this point.
- 2.3.20 Surveyor positions are annotated on **Figure 4**. Any bat emergence or re-entry activity was recorded. All surveys were conducted under suitable conditions. The dates of the surveys, surveyors and equipment used and weather conditions present are presented below.

¹ i.e. Anabat Express and Anabat Walkabout



Date	5 th June 2018	28 th June 2018	
Sunrise	04:45	04:43	
Start time	02:45	03:00	
End time	04:50	04:45	
Wind	Bft 1 (light breeze)	Bft 0 (calm)	
Precipitation	Dry	Dry	
Air temps	12°C	14°C	
Survey	Surveyor and	Surveyor and	
Position	Detector	Detector	
1	Marie Pickering Batbox Duet & AE ¹	Marie Pickering Batbox Duet	
2	Aidan Pickering Batbox Duet	Aidan Pickering Batbox Duet & AE	
3	Amy Sharples Batbox III & AE	Amy Sharples Batbox III & AE	
4	Danielle Rowlands Peersonic RPA3	Danielle Rowlands Peersonic RPA3 & AE	
5	Stuart Laverick Batbox Duet & AE	Natasha Reece Echometer Touch 2 PRO & AE	
6	Chris Wilkinson Pettersson D230 & AE	John Harrison Bryant Anabat Walkabout	
AE = Anabat Express			

Table 2.3: Dawn Re-entry Survey Dates, Weather Conditions and Surveyors

Bird Species

- 2.3.21 Bird species observed and heard during the survey were recorded.
- 2.3.22 Habitats throughout the site and in the immediate surrounding area were assessed for their value to roosting, feeding and nesting birds, as indicated by the amount of shelter, feeding value, woody vegetation structure and species diversity of tree and shrub species in the site.
- 2.3.23 The presence of any sign of barn owl within the buildings was searched for during the internal inspection of the buildings conducted on the 9th May 2018. All buildings were searched for pellets, faecal splashes and feathers which may indicate use by roosting or nesting barn owl in accordance with *The Barn Owl Conservation Handbook* (Barn Owl Trust, 2012) and *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment. Developing Best Practice in Survey and Reporting* (Shawyer, 2011).

Great Crested Newt

Desktop Search for Ponds

- 2.3.24 In accordance with current Natural England guidance (Natural England, 2015) all ponds within an unobstructed 500 metres of a site should be considered for their suitability to support breeding great crested newts. The potential of the proposed development to impact upon any great crested newt population(s) whose breeding ponds are within 500 metres must be considered.
- 2.3.25 The search of habitats in the wider area up to a distance of 500 metres from the site boundary revealed the presence of fourteen ponds, as detailed below.

Pond Reference	Grid Reference	Distance from Site Boundary	Location (refer to Figure 1)
1	SD 7078 0164	Within the site	Small drainage pond in north-east corner of the site.
2	SD 7069 0165	Within the site	Field pond adjacent to the northern site boundary.
3	SD 7111 0160	300 metres	Field pond east of the site.

Table 2.4: Ponds within 500 metres of the site



Consideration of Requirement for Further Survey

- 2.3.26 The requirement for further survey at each pond was then assessed using the following criteria:
 - a. The results of the desktop study;
 - b. Presence of dispersal barriers to great crested newt movements between ponds and the site, as detected during the walkover survey;
 - c. Distance of ponds from the site;
 - d. Potential influence of the proposed development of the site on any populations of great crested newt (if present at ponds), using the Natural England rapid risk assessment tool; and
 - e. Presence of other ponds which may form metapopulations and/or alter the influence of the site on ponds at greater distances.
- 2.3.27 Pond 3 was surveyed in 2015 in association with a planning application in the wider area. No great crested newts were detected, the results of this survey are presented at *Land at Chaddock Lane, Astley, Wigan, Ecological Survey and Assessment (Including a Great Crested Newt Survey)* (ERAP Ltd, 2015). Due to the distance from Pond 3 to the site boundary (300 metres) and the absence of great crested newt in 2015 it is considered that no further survey is required at Pond 3.
- 2.3.28 Further assessment of Ponds 1 and 2 in relation to great crested newt was considered necessary.

Habitat Suitability Index Assessment

- 2.3.29 Ponds 1 and 2 were assessed using the Habitat Suitability Index (HSI) (Oldham, et al., 2000) by Amy Sharples on 23rd April 2018. The ponds were examined with reference to the ten HSI scoring criteria, which are: SI₁: Geographical location; SI₂: Pond area; SI₃: Pond drying; SI₄: Water quality (as indicated by the diversity of aquatic plants and invertebrates); SI₅: Shade; SI₆: Waterfowl; SI₇: Fish; SI₈: Abundance of other ponds within a one kilometre radius; SI₉: Quality of terrestrial habitat; and SI₁₀: Macrophyte cover (i.e. aquatic and emergent plants). The survey was conducted in accordance with ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom (ARG UK, 2010).
- 2.3.30 An indication of the aquatic invertebrate diversity was obtained through the use of a fine-mesh, long-handled pond net, which was swept through the ponds at intervals around their margins.
- 2.3.31 The assessment followed guidance in relation to interpreting HSI scores, following the categorical scale shown below.

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

Table 2.5: Pond Habitat Suitability Index Categories

Assessment of Terrestrial Habitat

- 2.3.32 An assessment of the terrestrial habitat within the site for great crested newts was conducted, as informed by the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) and the *Great Crested Newt Conservation Handbook* (Langton, 2001).
- 2.3.33 Habitats present within the site were assessed for their value to support foraging, sheltering and hibernating great crested newt. Favourable habitats can comprise rough grassland, scrubland, woodland and sites with



underground crevices or cracks, such as mammal holes, voids in tree stumps or banks, and refugia such as rock piles or dead wood.

Great Crested Newt Environmental DNA (eDNA) Analysis

- 2.3.34 Environmental DNA (eDNA) analysis can detect the presence or absence of great crested newt from pond water samples. Pond water samples were collected at Ponds 1 and 2 on 9th May 2018 by Amy Sharples and Victoria Burrows. Both surveyors hold Natural England Class Survey Licences for the survey of great crested newt, Amy Sharples Natural England Class Survey Licence (Level 2) Registration Number 2015-16679-CLS-CLS and Victoria Burrows Natural England Class Survey Licence (Level 1) Registration Number 2015-16651-CLS-CLS. All surveyors have extensive experience of great crested newt surveys.
- 2.3.35 The surveys were carried out in accordance with the sampling protocol in *Appendix 5: Technical Advice Note for field and laboratory sampling of Great Crested Newt (Triturus cristatus) environmental DNA* (DEFRA, 2014) that accompanies Defra's research project and are outlined below:
 - a. Twenty 30ml samples were taken from around the entire perimeter of the pond and areas most likely to be used by great crested newt were targeted, where possible, without entering the water;
 - b. Prior to taking the sample the water column was gently mixed at each sampling location but care was taken to avoid disturbing the sediment on the base of the pond;
 - c. Once all 20 samples has been taken 15ml of the total sample were pipetted into each of the six sampling tubes containing ethanol ensuring the water in the sample bag was mixed prior to and taking each of the 15ml samples; and
 - d. The six sampling tubes were shaken to mix the sample and preservative.
- 2.3.36 At all times the surveyors ensured the sampling equipment avoided risk of contamination by not placing the ladle or pipet on the ground or otherwise contaminated surfaces and by changing gloves between the initial sampling and the pipetting stages of the method.
- 2.3.37 The equipment was purchased from SureScreen Scientifics and the collected samples were returned to them for qPCR laboratory analysis.

Reptile Species

2.3.38 The site and its surroundings were assessed in terms of their suitability for use by reptile species using the important characteristics for reptiles outlined in the draft document '*Reptile Mitigation Guidelines*' (Natural England, 2011), and the *Reptile Habitat Management Handbook* (Edgar, et al., 2010). These habitat characteristics are outlined below.

1. Location (in relation to species range)	7. Connectivity to nearby good quality habitat
2. Vegetation Structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime

Table 2.6: Important Habitat Characteristics for Reptiles

Water Vole & Otter

6. Surface geology

2.3.39 Ellenor Brook watercourse flows through the southern area of the site, and a ditch (Ditch 1) lies on the eastern site boundary (refer to Figure 2). A water vole survey was undertaken by Chris Swindells B.Sc. (Hons) on 12th May 2018. The weather was sunny with scattered cloud and a light breeze (Beaufort Scale 1) with an air temperature of 16°C.

12. Egg-laying site potential



- 2.3.40 The brook and ditch corridors within the site boundary were examined for evidence of use by water vole (only sections within the site boundary were included in the survey effort). The survey methodology detailed in *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series) Eds. Fiona Mathews and Paul Chanin* (Dean, et al., 2016), was applied and the watercourse and associated banks were searched for burrows, latrines, feeding remains, runs, feeding lawns, nests and footprints.
- 2.3.41 An assessment of the suitability of Ellenor Brook and Ditch 1 was undertaken to assess their suitability for use by otter (*Lutra lutra*) in accordance with the habitat requirements and preferences detailed in *Ecology* of the European Otter. Conserving Natura 2000 Rivers, Ecology Series 10 (Chanin, 2003) and searches were made for signs of otter in accordance with *Monitoring the Otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10 (Chanin, 2003) and current Natural England guidance (Natural England, 2014).
- 2.3.42 Ellenor Brook and Ditch 1 was searched for dung (spraints), tracks (footprints), feeding remains, otter slides (into water), holts (underground dens) and couches (above ground sites where otters rest during the day).

2.4 Survey Limitations

- 2.4.1 Access to examine the internal areas of the single storey annexes at the north elevation of Building 1 (the farmhouse) was not possible. To overcome this limitation these sections of building were examined from the exterior and observed during the dawn re-entry surveys.
- 2.4.2 All other areas of the site were accessible; no other survey limitations occurred.

2.5 Evaluation Methodology

- 2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977) and *Guidelines for the Selection of Biological SSSIs* (Bainbridge, et al., 2013). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.
- 2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities* (NERC) *Act 2006.* Where suitable, the ecological value of the habitats present have been assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition* (CIEEM, 2016).
- 2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Great Britain Department for Communities and Local Government, 2012) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedules 1, 5, 6 and 8 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2017*, is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.
- 2.5.4 The presence of any Priority Species, as listed under Section 41 of the *NERC Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of habitats and/or species listed by the Greater Manchester Biodiversity Action Plans has been taken into account in the evaluation of the site.



3.0 SURVEY RESULTS

3.1 Desktop Study

Designated Sites for Nature Conservation

- 3.1.1 There are no statutory designated sites for nature conservation within a 1 kilometre radius of the site.
- 3.1.2 Two non-statutory designated Sites of Biological Importance (SBIs) lie within a 1 kilometre radius of the site; Ponds North of Cleworth Hall (South) SBI located 665 metres north of the site and Damhouse Wood SBI located 985 metres south-west of the site.
- 3.1.3 The site lies within a Site of Special Scientific Interest (SSSI) Impact Risk Zone for Astley and Bedford Mosses SSSI and Special Conservation Area (SAC), located 3.6 kilometres south of the site, and designated for its lowland raised moss. The SSSI Impact Risk Zone requires the Local Planning Authority to consult with Natural England on likely risks from the following development categories (Ordnance Survey, 2018):

"Infrastructure: Airports, helipads and other aviation proposals.

- Air Pollution: Any industrial / agricultural development that may cause air pollution including industrial processes, livestock and poultry units with floorspace greater than 500m², slurry lagoons greater than 750m² and manure stores greater than 3500 tonnes.
- Combustion: General combustion processes greater than 50 megawatt energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis / gasification, sewage treatment works and other incineration / combustion."
- 3.1.4 The presence of the SSSI Impact Risk Zone and SBIs is considered further at **Section 4.2**, below.

Protected and Notable Species

3.1.5 GMLRC does not hold any records of protected and notable species for the site. Records of protected and notable species for a 1 kilometre radius of the site are presented at **Table 3.1** below.



Taxon Group	Species Name and Designations ¹ and Notes			
Terrestrial	Common pipistrelle (<i>Pipistrellus pipistrellus</i>) EPS, WCAs5, GMBAP			
maninais	Pipistrelle species (<i>Pipistrellus</i> sp.) EPS, WCAs5, GMBAP One roost located 335 metres south-west of the site and two further records of activity within 1 kilometre.			
	Bat species EPS, WCAs1, GMBAP One record of activity within 1 kilometre.			
Amphibians	Great crested newt (<i>Triturus cristatus</i>) EPS, WCAs5, PS, GMBAP Four records, the closest being 809 metres north of the site. Two records lie 109 metres south-east of the site, however the pond was surveyed in 2015 and no great crested newt were detected. The pond has since been removed as part of a development in the wider area.			
Mollusc	Mud snail (<i>Omphiscola glabra</i>) PS One record 846 metres north of the site.			
Birds	Birds PS Lapwing (Vanellus vanellus), lesser redpoll (Carduelis cabaret), reed bunting (Emberiza schoeniclus starling (Sturnus vulgaris)			
¹ Key to Desi EPS = Europ WCAs5 = Sp PS = Priority GMBAP = Sp	Ignation Codes: bean Protected Species under the <i>Conservation of Habitats and Species Regulations 2017.</i> becies receives full protection under Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended). Species listed under Section 41 of the NERC Act 2006 becies listed on the Greater Manchester Biodiversity Action Plan Provisional Long List			

Table 3.1: Records of Protected Species Within a 1 Kilometre Radius of the Site

3.1.6 The presence of these protected and notable species within the wider area has been taken into account throughout this report.

3.2 Vegetation and Habitats

General Description

- 3.2.1 The approximately 2.8 hectare site lies on the northern extremity of Astley and the south-eastern extremity of Tyldesley and comprises a farm house and four associated outbuildings and hard standing, semiimproved grassland, tall-herb vegetation, scrub, ponds, a ditch and a section of Ellenor Brook.
- 3.2.2 The northern site boundary lies adjacent to Tyldesley Cemetery and is defined by a tree line associated with the cemetery grounds. The southern site boundary is defined by a hedgerow and is associated with Garrett Lane, beyond which are existing residential properties and an active residential construction site. The eastern site boundary is defined by Ditch 1, beyond which lie fields of improved grassland. The western site boundary lies at the crossing point of Hough Lane and Ellenor Brook.
- 3.2.3 For all habitat descriptions refer to the Phase 1 Habitat Survey map appended at **Figure 2**. Photographs are appended at **Table 8.5**.

Farmyard and Northern Boundary

- 3.2.4 The farmyard supports colonising vegetation and an area of semi-improved grassland at the eastern boundary. The northern boundary supports tall-herb vegetation and scrub.
- 3.2.5 The colonising vegetation (**Photos 1** and **2**) comprises occasional Cleavers (*Galium aparine*), Indian Balsam (*Impatiens glandulifera*) with locally abundant Red Fescue (*Festuca rubra*), Annual Meadow-grass (*Poa annua*) and Common Chickweed (*Stellaria media*).
- 3.2.6 The semi-improved grassland (**Photo 3**) comprises frequent Cock's-foot (*Dactylis glomerata*), Yorkshire-fog (*Holcus lanatus*) and Perennial Rye-grass (*Lolium perenne*) with occasional Smooth Meadow-grass



(*Poa pratensis*) and Rough Meadow-grass (*Poa trivialis*) and locally abundant Common Bent (*Agrostis capillaris*), Common Mouse-ear (*Cerastium fontanum*), Red Fescue and Common Chickweed.

- 3.2.7 The tall-herb vegetation (**Photo 4**) at the northern site boundary comprises occasional Rosebay Willowherb (*Chamerion angustifolium*), Great Willowherb (*Epilobium hirsutum*), Cleavers and locally abundant Common Nettle (*Urtica dioica*).
- 3.2.8 The scrub vegetation (**Photo 5**) at the northern site boundary comprises occasional Indian Balsam, Cleavers and locally abundant Field Maple (*Acer campestre*), Norway Maple (*Acer platanoides*), Silver Birch (*Betula pendula*) trees with Hawthorn (*Crataegus monogyna*), Ivy (*Hedera helix*) and Bramble (*Rubus fruticosus* agg.).
- 3.2.9 The colonising vegetation and scrub vegetation are not characteristic of an NVC community.
- 3.2.10 The semi-improved grassland has affinities with an *MG7 Perennial Rye-grass* community of the NVC (Rodwell, 1992). The tall-herb vegetation is characteristic of an *OV26 Great Willowherb* and an *OV27 Rosebay Willowherb* tall-herb herb community of the NVC (Rodwell, 2000). A plant species list is appended at **Table 8.1**.

Field Unit

- 3.2.11 The field unit within the site supports grazed semi-improved grassland with an area of scrub and an area of tall-herb at the western boundary and Bramble scrub scattered throughout.
- 3.2.12 The semi-improved grassland (**Photos 6** and **7**) comprises constant and abundant Perennial Rye-grass with abundant Cock's-foot and Yorkshire-fog and frequent Smooth Meadow-grass and Rough Meadow-grass. Moss species, Annual Meadow-grass, Creeping Buttercup (*Ranunculus repens*) and White Clover (*Trifolium repens*) are locally abundant.
- 3.2.13 The scrub and Bramble scrub (**Photo 8**) comprises occasional Indian Balsam with locally abundant Hawthorn, Ash (*Fraxinus excelsior*), Cleavers and very locally abundant Bramble.
- 3.2.14 The tall-herb vegetation (**Photo 9**) comprises occasional Common Nettle with locally abundant Rosebay Willowherb and Cleavers.
- 3.2.15 The scrub is not characteristic of an NVC community.
- 3.2.16 The semi-improved grassland is characteristic of an *MG7 Perennial Rye-grass* community of the NVC (Rodwell, 1992). The Bramble scrub is characteristic of a *W24 Bramble Yorkshire-fog* underscrub community of the NVC (Rodwell, 1991). A plant species list is appended at **Table 8.2**.

Hedgerows

- 3.2.17 Hedgerow 1 (Photo 10) is located at the southern site boundary associated with Garrett Lane and continues along the access track and is 97 metres in length. Hedgerow 2 (Photo 11) is associated with the access track and is 28 metres in length. Hedgerow 3 (Photo 12) is located at the northern boundary of the semi-improved grassland and is 32 metres in length. All hedgerows are cut.
- 3.2.18 The woody vegetation of Hedgerow 1 is constant and abundant Hawthorn with locally abundant Pedunculate Oak (*Quercus robur*) and Holly (*Ilex aquifolium*). The herb layer comprises constant and abundant Cleavers with occasional Cow Parsley (*Anthriscus sylvestris*) and locally abundant Cock's-foot, Ivy, Yorkshire-fog, Perennial Rye-grass, Smooth Meadow-grass and Common Nettle.
- 3.2.19 The woody vegetation of Hedgerow 2 is composed of constant and abundant Hawthorn with locally abundant Holly. The herb layer comprises constant and abundant Cleavers with occasional Cow Parsley and locally abundant Cock's-foot, Ivy, Yorkshire-fog, Perennial Rye-grass, Smooth Meadow-grass and Common Nettle.



- 3.2.20 The woody vegetation of Hedgerow 3 supports constant and abundant Hawthorn with locally abundant Sycamore (*Acer pseudoplatanus*). The herb layer comprises constant and abundant Cleavers with locally abundant Herb-Robert (*Geranium robertianum*), Ivy, Yorkshire-fog, perennial Rye-grass, Annual Meadow-grass, Creeping Buttercup and Common Nettle.
- 3.2.21 The vegetation at Hedgerows 1 to 3 is characteristic of a *W*21 Hawthorn Ivy scrub community of the NVC (Rodwell, 1991). A plant species list is appended at **Table 8.3**.
- 3.2.22 None of the hedgerows qualify as 'important' when assessed in accordance with *The Hedgerows Regulations 1997* Wildlife and Landscape criteria. Full assessments of the hedgerows are appended at **Table 8.4**.

Ellenor Brook and Ditch 1

- 3.2.23 Ellenor Brook (**Photos 13** to **16**) flows through the southern area of the site. The brook channel is 2 metres wide at the top of the banks with a 30° slope. The banks comprise brown earth and concrete. The water channel is 1.5 metres wide and 0.3 metres deep. The bed of the brook comprises brown earth and stones.
- 3.2.24 Giant Hogweed (*Heracleum* mantegazzianum) is continuous along the brook corridor.
- 3.2.25 Ditch 1 (Photo 17) is 0.5 metres wide and 0.3 metres deep. At the time of the survey the ditch was dry.

Invasive Plant Species

- 3.2.26 An area of Japanese Knotweed is present adjacent to the north-west corner of the site.
- 3.2.27 As illustrated on **Figure 2**, Indian Balsam and Giant Hogweed are located throughout the site. All these species are listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) it is an offence to spread or cause the spread of these species in the wild. Further guidance is described in **Section 5.4**.

3.3 Animal Life

Badger

3.3.1 No signs of badger such as setts / holes, prints, hairs or snuffle holes were detected at the site or within 50 metres of the site boundary. No records of badger within a 1 kilometre radius of the site were reported in the data search. The presence of badger at the site is reasonably discounted and no further survey is required.

Bat Species

Daylight Survey: Buildings

Building 1: Farmhouse

- 3.3.2 Building 1 (**Photos 18** to **31**) is a brick T-shaped building with pitched slate covered roofs and single storey annexes with monopitch slate and stone tile covered roofs attached to the north elevations.
- 3.3.3 The elevation walls comprise either well-pointed brick or concrete render. Timber window frames are present; all of which appear to be well-sealed with no opportunities or gaps for bats around the frames.
- 3.3.4 Opportunities for bat access are present at the roof such as between the slates and beneath the ridge copings, particularly at the east facing side of the stone tile covered annex. Around other areas of the building opportunities for bat access are present beneath the lead flashing at the base of the chimneys, between gaps at the brickwork at the chimney stacks and behind timber fascia on the western elevation. No bats or droppings were found around the external perimeter of the building.



- 3.3.5 The roof void above the two storey section was accessed and examined. Access to the whole void was possible. The void has traditional king post construction and is approximately 2 metres high from floor to ridge. A thin layer of insulation is present on the floor of the void. No underfelt is present and the underside of the slates and parging is visible. The void is dusty and heavily covered with cobwebs. All sections of ridgeboard are cobweb covered. Holes permitting access to the roof void from the exterior are present at slipped slates and over the wall top at the gable ends, particularly at the western gable. No bats or bat droppings were found.
- 3.3.6 A cellar is present at the south-eastern corner of the building. The internal walls are brick lined and painted. No bats or droppings were found in the cellar; no access to this area from the exterior is possible.
- 3.3.7 No evidence of a roost was found, however, owing to the identified features, Building 1 is assessed to have moderate suitability for use by crevice roosting bat species.

Building 2

- 3.3.8 Building 2 (**Photos 32** to **40**) is described in three sections (2a to 2c).
- 3.3.9 Section 2a comprises a concrete block sheep shed with a pitched corrugated sheet covered roof. The external and internal sides of the elevation walls are well-pointed with no opportunities for bat access. An asbestos fascia overhangs the roof verge at the eastern and western gable ends; this appeared to be tight fitting against the brick work.
- 3.3.10 No bats or evidence of use by roosting bats were found and Section 2a is assessed to have low suitability for use by roosting bats.
- 3.3.11 Section 2b is a brick two storey building that was formerly used as a milking shed. The timber floor between the storeys is dilapidated and partially collapsed which prevented access to the upper floor. Inspections through holes in the ground floor ceiling confirmed an absence of a roof void; the upper floor is open to the underside of the corrugated sheet covered pitched roof.
- 3.3.12 No bats or evidence of use by roosting bats were found and Section 2b is assessed to have low suitability for use by roosting bats.
- 3.3.13 Attached to the eastern gable of Section 2b is Section 2c which comprises a brick barn with a pitched corrugated sheet covered roof and timber roof trusses. A crack in the brick work is present at the south-eastern corner which creates a crevice suitable for bat access.
- 3.3.14 No bats or evidence of use by roosting bats were found and Section 2c is assessed to have low suitability for use by roosting bats.
- 3.3.15 Section 2d is a two storey pitched roof annexes attaches to the south elevation of Section 2c. The brick building has a pitched stone tile covered roof. The presence of underfelt is not known as the upper storey was not accessible. No bats or evidence of use by roosting bats were found and Section 2d is assessed to have low suitability for use by roosting bats.
- 3.3.16 Section 2e is present at the south-eastern corner of the building cluster and comprises a brick building with a pitched slate covered roof which is lined with underfelt beneath. No bats or evidence of use by roosting bats were found and Section 2e is assessed to have low suitability for use by roosting bats.

Building 3

3.3.17 Building 3 (**Photos 41** and **42**) is a steel framed three-sided structure with corrugated sheet covered walls and pitched roof. A timber framed three sided lean-top with a corrugated sheeting covered pitched roof is present at the western side. No bats or evidence of use by roosting bats was found. Careful examination of the building and the absence of potential roost features supports the conclusion that Building 3 has negligible suitability for use by roosting bats.



Building 4

3.3.18 Building 4 (**Photos 43** to **45**) is a timber framed sheep shed with a pitched corrugated metal sheet covered roof. No bats or evidence of use by roosting bats was found. Building 4 has negligible suitability for use by roosting bats.

Building 5

- 3.3.19 Building 5 (**Photo 46** to **50**) is a brick barn with a pitched corrugated sheet covered roof supported on steel framed trusses. The building has large apertures on all sides to create a light and exposed internal area. Minor cracks and crevices are present in the brick elevations (i.e. shallow crevices that do not extend further than 0.8 metres into the wall or extend through a single-ply wall to the other side); no bats or droppings were found.
- 3.3.20 Building 5 has negligible suitability for use by roosting bats.
- 3.3.21 It is accepted that bat species such as brown long-eared bats can access open building such as Buildings 2, 3, 4 and 5 and use the structures as night roosts and feeding roosts. However careful examination of the buildings found no evidence (such as bats, droppings or insect prey remains) of this.

Trees

3.3.22 No trees within the site support features suitable for use by roosting bats. The presence of roosting bats at the trees within the site boundary is reasonably discounted.

Dawn Re-entry Surveys

5th and 28th June 2018

- 3.3.23 No bat emergence was detected at Building 1 or 2 during the dawn re-entry surveys on the 5th and 28th June 2018.
- 3.3.24 Common pipistrelle (*Pipistrellus pipistrellus*) bats were detected foraging around the site throughout the surveys.
- 3.3.25 During the survey undertaken on the 5th June 2018, five soprano pipistrelle (*Pipistrellus pygmaeus*) contacts were detected. During the survey undertaken on the 28th June 2018 one soprano pipistrelle contact was detected. No other bat species were detected.
- 3.3.26 The raw data are appended at **Tables 8.6** and **8.7**.

Commuting and Foraging Bats

- 3.3.27 The habitats associated with the buildings and hard standing, semi-improved grassland, tall-herb vegetation and Bramble scrub within the site do not provide sheltered 'edge' habitat and are unlikely to provide a diversity or abundance of invertebrate prey for foraging bat species. These habitats within the site are considered to have low suitability for foraging and commuting bats in accordance with the criteria listed in **Table 2.1**.
- 3.3.28 The scrub and Bramble scrub at the northern and western boundaries of the site and the hedgerows within the site provide suitable edge habitats for foraging bats, but are limited in their extent and do not create a link between favourable habitats; these areas are of low to moderate suitability for use by foraging bats, in accordance with the criteria listed in **Table 2.1**.
- 3.3.29 Habitats in the wider area, such as the mature tree lines within Tyldesley Cemetery, provide highly suitable habitats for use by commuting and foraging bats.



Bird Species

- 3.3.30 Nesting house sparrow (*Passer domesticus*) are present beneath eaves at the east, west and south elevations of Building 1 (the farmhouse). Three old swallow (*Hirundo rustica*) nests were found at Building 2e.
- 3.3.31 The scrub and Bramble scrub within the site provides habitat suitable for use by nesting birds.

Barn Owl

3.3.32 No evidence of use of the buildings by nesting or roosting barn owl was found. The presence of nesting and roosting barn owl is reasonably discounted. No further survey is required.

Great Crested Newt and other Amphibians

3.3.33 The results of the Habitat Suitability Index (HSI) assessment of Pond 1 (Photo 52) and Pond 2 (Photo 53) are provided below.

Criteria	Description	Pond 1	Score ¹	Pond 2	Score ¹
SI1	Location	A, optimal	1.0	A, optimal	1.0
SI ₂	Pond area	10m ²	0.05	5m ²	0.05
SI₃	Permanence	Sometimes dries	0.5	Sometimes dries	0.5
SI4	Water quality	Poor	0.33	Bad	0.01
SI ₅	Shade	50%	1.0	100%	0.2
SI ₆	Waterfowl	Minor impact	0.67	Minor impact	0.67
SI7	Fish	Absent	1.0	Absent	1.0
SI8	Pond count ²	2	0.55	2	0.55
Sl9	Terrestrial habitat	Good	1.0	Poor	0.33
SI 10	Macrophyte cover	0%	0.3	0%	0.3
Assessment Result: Below Average 0.50 Poor 0.27				0.27	
¹ Calculated by (SI ₁ x SI ₂ x SI ₃ x SI ₄ x SI ₅ x SI ₆ x SI ₇ x SI ₈ s SI ₉ x SI ₁₀) ^{1/10}					
² Ponds within an unobstructed one kilometre radius					

Table 3.2: Habitat Suitability Index Assessment for Ponds 1 and 2

3.3.34 The eDNA analysis returned negative results for both Ponds 1 and 2, refer to **Appendix 2**.

Reptiles

3.3.35 There are no records of reptile for the site or the wider area; it is not considered reasonably likely that reptiles will have colonised the formerly developed site from the surrounding land. The presence of reptiles within the site is reasonably discounted.

Water Vole

3.3.36 No evidence of water vole or otter was detected during the survey. The presence of water vole and otter at the site is reasonably discounted.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

4.1.1 It is proposed to redevelop the site to housing, associated roads and hard standing. At the time of writing a proposals plan was not available for the site.



4.1.2 **Section 4.2** provides an assessment of any impacts of the proposed development on the designated sites in the wider area. The ecological value of habitats within the site are evaluated at **Section 4.3**, and the presence of protected and notable species is considered at **Section 4.4**.

4.2 Designated Sites for Nature Conservation

- 4.2.1 The site is not functionally linked to the SBIs present in the wider area, and does not support any habitats which would contribute to the nature conservation value of the SBIs or Astley and Bedford Mosses SSSI. The section of Ellenor Brook which lies within the site is linked to watercourses in the wider area which are hydrologically linked to the Astley and Bedford Mosses SSSI.
- 4.2.2 The proposals do not match the criteria for which further consideration would be required by Natural England in relation to potential impacts to Astley and Bedford Mosses SSSI as a consequence of the proposed development. The section of Ellenor Brook within the site must be retained and protected.
- 4.2.3 The proposals will have no impact upon any designated site for nature conservation.

4.3 Vegetation and Habitats

- 4.3.1 The site contains only common and widespread plant species. The mature trees and shrubs are of local value as they add structural diversity and support nesting birds. None of the habitats within the site are of significant interest in terms of their plant species composition. None of the habitats present are representative of semi-natural habitat. The NVC communities present are typical of the geographical area and conditions present.
- 4.3.2 The hedgerows within the site do not qualify as 'important' when assessed under *The Hedgerow Regulations 1997* landscape and wildlife criteria. Hedgerows 1 to 3 qualify as Priority Habitat. The hedgerows will be retained, where feasible. If the removal of a section of hedgerow is unavoidable compensatory planting is feasible, as described at **Sections 5.2** and **5.8**.
- 4.3.3 The scrub and Bramble scrub are of site value as they contribute to the diversity of habitats within the site and are suitable for use by nesting birds. The scrub in the western area of the site is listed on the Deciduous Woodland Priority Habitat Inventory for England. Recommendations for the retention and protection of the scrub and Bramble scrub are presented at **Section 5.2**.
- 4.3.4 Ellenor Brook is a main river, as defined by the Environment Agency. The protection of Ellenor Brook and its associated wildlife corridor value will be achieved by the proposals, as described at **Section 5.2**.
- 4.3.5 Japanese Knotweed, Indian Balsam and Giant Hogweed were detected within the site, and all are listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended). It is an offence to spread or cause the spread of these species in the wild. Recommendations in relation to invasive species are presented at **Section 5.4**.
- 4.3.6 Ponds 1 and 2 do not qualify as Priority Habitat; both ponds are of site value as they contribute to the diversity of habitats within the site and Pond 1 is suitable for use by amphibians. Recommendations to achieved the retention and protection of Pond 1 are described at **Section 5.2**.

4.4 Protected Species and Other Wildlife

- 4.4.1 Appropriate and proportionate survey effort, in accordance with standard survey guidelines has been applied to reasonably discount the presence of other relevant protected species namely badger, roosting bats, Schedule 1 bird species, great crested newt, water vole, otter and reptiles. No further surveys for other protected species are necessary to support a planning decision.
- 4.4.2 Recommendations relating to the retention of features suitable for use by foraging bats, and features to enhance habitats for roosting bats at the site are presented at **Section 5.5**.



- 4.4.3 The buildings and areas of scrub and Bramble scrub provide favourable foraging and nesting habitat for passerine birds; these habitats will be removed by the proposals. Mandatory measures to protect nesting birds during site clearance and actions to provide compensatory opportunities for nesting birds are recommended and will be achieved by the proposals, refer to **Sections 5.6** and **5.8**.
- 4.4.4 Recommendations for the long-term conservation of breeding amphibians and the site and protection during the construction period are described at **Section 5.7**.

5.0 RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Introduction

- 5.1.1 The recommendations aim to ensure that the development is implemented in accordance with all wildlife legislation, Natural England guidance, the principles of the National Planning Policy Framework (NPPF), local planning policy and best practice.
- 5.1.2 The recommendations are appropriate and proportionate to the scale of the redevelopment proposals. Where possible, opportunities to enhance the ecological interest and seek biodiversity gain through appropriate landscape planting and habitat creation have been identified, as required by the NPPF and other relevant planning documents.
- 5.1.3 All recommendations are appropriate to the geographical area, the habitats in the wider area, the wildlife present in the local area (and likely to use the site post-construction) and take into consideration the end use of the site as a residential development.
- 5.1.4 A Constraints and Opportunities Plan to illustrate the recommendations in relation to the design of the site layout and opportunities for enhancement is presented at **Figure 5**.

5.2 Recommendations in Relation to Site Layout and Protection of Existing Vegetation

Features / Habitats to be Retained

- 5.2.1 It is recommended that the site layout is designed to ensure the retention and protection of Ellenor Brook, Ponds 1 and 2, Ditch 1 and the hedgerows within the site and the boundary trees associated with Tyldesley Cemetery. Where feasible it is advised that the vegetation in the west of the site should be retained and protected.
- 5.2.2 During the construction phase, temporary protective demarcation fencing will be used to protect the trees and shrubs to be retained. The fencing must extend outside the canopy of the retained trees and must remain in position until all areas have been developed to ensure protection is provided throughout the construction phase.
- 5.2.3 The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

Hedgerows

5.2.4 It is recommended that the hedgerows within the site boundary are retained and protected. If the removal of any hedgerow or section of a hedgerow is required to facilitate the development, compensatory planting will be required. Appropriate compensatory planting is native linear planting of an equal to or greater length than the length of hedgerow scheduled for removal.



Protection of Ellenor Brook, Ponds 1 and 2 and Ditch 1

- 5.2.5 It is recommended that the section of Ellenor Brook within / adjacent to the site is retained as an open channel and protected by a minimum 8 metre undeveloped buffer. To discourage fly tipping it is recommended that the site layout is designed so houses do not back on to the brook.
- 5.2.6 It is recommended that Ditch 1 is retained and protected with a minimum 5 metre undeveloped buffer.
- 5.2.7 The section of Ellenor Brook running through the site, Ponds 1 and 2 within the site and Ditch 1 at the eastern boundary should be protected during the construction and operational phase through implementation of best practice. The following Pollution Prevention Guidelines (PPG) will be adhered to:
 - a. PPG1: Basic good environmental practices (Environment Agency, 2013);
 - b. PPG5: Works in, near or over watercourses (Environment Agency, 2014);
 - c. PPG6: Construction and demolition sites (Environment Agency, 2012); and
 - d. PPG7: Operating refuelling sites (Environment Agency, 2011).

5.3 Ponds

- 5.3.1 It is recommended that Ponds 1 and 2 are retained and protected by a minimum 10 metre undeveloped buffer.
- 5.3.2 If retained, both Ponds 1 and 2 will require enhancement. Both ponds will be excavated to create permanent margins. Scrub at Pond 1 will also be removed to ensure the area remains flooded.
- 5.3.3 If the retention of both ponds is not feasible to facilitate the development at the site, it is recommended that one compensatory wildlife pond is included within the site boundary. Any new pond must be located in an area with connectivity to the wider area to the north and / or east of the site.
- 5.3.4 Any works required at Ponds 1 and 2 (including enhancement and removal) must be undertaken outside the amphibian breeding season (March to July inclusive).

Creation of New Wildlife Ponds

- 5.3.5 If the removal of Ponds 1 and 2 is required at least one new pond designed specifically for biodiversity will be created within the site. The pond will be constructed to the specification as advised by the Amphibian and Reptile Conservation (ARC) publication *Amphibian Habitat Management Handbook* and will comprise:
 - a. At least 350m2 in area;
 - b. Gently sloping scalloped margins (0.05m to 0.5m deep) to create shallows for the colonisation by wetland and emergent plants;
 - c. A deeper 'sump' (1.25m depth) to ensure an area of open water remains present during periods of dry weather;
 - d. A clay-lined or bentonite bed (rather than an artificial plastic liner);
 - e. The possible use of roof water from adjacent buildings to 'top-up' the pond should be explored (road surface water will not be used owing to the risk of pollution by hydrocarbons);
 - f. Planting of the margins with native species such as Yellow Iris, Common Water Plantain, Purple Loosestrife, Marsh Bedstraw, Lesser Spearwort, Water Forget-me-not, Gipsywort, Brooklime, Meadowsweet and Marsh Marigold. Bulrush will not be planted as this can quickly become invasive;
 - g. For health and safety reasons it may be necessary to install a knee-rail fence to demarcate the pond edges;



- h. A buffer of at least 5 to 10 metres of grassland habitat will be present between the pond margins and any roads or built development;
- i. Fish will not be introduced to the pond;
- j. As part of the landscape planting proposals the land around the pond will be seeded with a low maintenance wildflower grassland such as the EM1 mix supplied by www.wildseeds.co.uk; and
- k. The planting of trees and shrubs in proximity to the ponds should be avoided as the ponds will soon become choked with leaves.

5.4 Invasive Plant Species

- 5.4.1 It is an offence under the *Wildlife and Countryside Act 1981* (as amended) to cause the spread of Japanese Knotweed, Indian Balsam and Giant Hogweed in the wild. It is recommended that a specialist invasive species contractor is contacted to provide a method statement for the treatment of the invasive species within the site.
- 5.4.2 Due to the toxicity of Giant Hogweed and the potential to cause skin burns, it is recommended that the method statement includes future monitoring and treatment of invasive species within the site and along the brook corridor.

5.5 Bats

Lighting

5.5.1 Paragraph 125 in Chapter 11 (conserving and enhancing the natural environment) of the National Planning Policy Framework (NPPF) states:

"By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation".

Construction Phase

5.5.2 Any lighting to be used at the site during construction should be directional and screened where possible, this specification should be included within a Construction Environment Management Plan (CEMP), or similar.

Development Lighting Design

- 5.5.3 The lighting scheme to be implemented at the developed site must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over Ellenor Brook, any retained habitats such as ponds, hedgerows and boundary trees associated with Tyldesley Cemetery, areas of ecological enhancement and any landscape planting as lighting overspill may deter use by wildlife such as foraging bats.
- 5.5.4 The lighting scheme will be designed with reference to current guidance, namely:
 - a. *Artificial lighting and wildlife. Interim Guidance: Recommendations to help minimise the impact of artificial lighting.* (Bat Conservation Trust, 2014); and
 - b. Bats and lighting: Overview of current evidence and mitigation guidance (Stone, 2014).

Validity of Survey

5.5.5 The results of the activity surveys at Buildings 1 and 2 remain valid until the 2019 bat activity survey season. If no works have commenced at the buildings prior to May 2019 updated surveys will be required.



Reasonable Avoidance Measures (RAMs) in Relation to Bat Species

- 5.5.6 Subject to the absence of nesting birds, refer to **Section 5.6**, there is no timing constraint on the commencement of works at the site in relation to bats.
- 5.5.7 As a precaution, during demolition works all contractors must wear gloves.
- 5.5.8 It is recommended that the roofs at Buildings 1 and 2 are removed carefully by hand.
- 5.5.9 If at any time a bat is found or suspected, all works in the area must stop and ERAP (Consultant Ecologists) Ltd must be contacted for guidance (01772 750502).

Discovery of a Bat

5.5.10 If at any time during the works a bat is discovered or suspected all contractors must withdraw from the area and ERAP (Consultant Ecologists) Ltd (01772 750502) or Natural England must be contacted for further guidance.

Enhancing Habitats for Roosting Bats

- 5.5.11 It is recommended that the development incorporates the installation of commercially available bat access panels at the new buildings. The number and location of the bat access panels will be advised by an ecologist upon completion of the site layout.
- 5.5.12 The bat access panels should be sited at least four metres above ground level, ideally facing or close to areas of landscape planting or existing linear features such as Ellenor Brook. The access panels should not be positioned over windows or doorways where bat droppings may become a nuisance. Suitable bat access panels are available from NHBS Ecology (www.nhbs.com), Wild Care Shop (www.wildcareshop.com) or IBStock (www.ibstockbrick.co.uk) and are presented at **Insert 1**, below:



Insert 1: Example of commercially available bat access panels (Enclosed Bat Box B and C and Habibat products).

5.6 Birds

Protection

- 5.6.1 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is advised that any works such as vegetation clearance that will affect habitats suitable for use by nesting birds are scheduled to commence outside the bird nesting season. Commencement of works in the nesting season must be informed by a pre-works nesting bird survey, carried out by a suitably experienced ecologist. The bird breeding season typically extends between March to August inclusive.
- 5.6.2 If breeding birds are detected the ecologist will issue guidance in relation to the protection of the nesting birds in conjunction with the scheduled works. This may involve cordoning off an area of the site until the young birds have fledged.



Enhancing Habitats for Nesting Birds

- 5.6.3 The installation of bird nest boxes is recommended at the proposed new buildings. The number and location of the bird nest boxes will be advised by an ecologist upon completion of the site layout.
- 5.6.4 The bird nest boxes will be not be positioned over windows or doorways where droppings may become a nuisance. RSPB advice states that boxes should ideally be sited facing north to east, to avoid exposure to direct sunlight, which may cause overheating of chicks in the nest. Suitable bird nest boxes are available from the NHBS (www.nhbs.com) or Wild Care Shop (www.wildcareshop.com). Examples of suitable bird nest boxes are presented at **Insert 2**, below:



Insert 2: House Sparrow Nesting Terrace, 1MR Schwegler Avianex Nest Box, Vivara Pro WoodStone Starling Nest Box and Vivara Pro Cambridge Brick Faced Swift Nest Box

5.7 Reasonable Avoidance Measures for the Protection of Amphibians

Maintenance of Conditions as Described in this Report

5.7.1 Between now and the commencement of construction the habitats within the development site will be maintained as described at **Section 3.2**. The habitats within the site will not be permitted to grow dense or rank which will increase the opportunities for attraction of sheltering amphibians.

Measures to be Observed During Construction

A copy should be kept at the site office and be free to view on request.

- 5.7.2 The following Reasonable Avoidance Measures (RAMs) should be observed during the construction phase of development:
 - a. All site personnel must be made aware of this RAMs Method Statement;
 - b. The habitats within the site will be maintained at the current conditions, if strimming or mowing is required, all arisings must be removed from the site;
 - c. Site personnel must be trained in the identification of amphibian species;
 - d. During construction, bricks etc. must be stored on pallets or raised from the ground in another suitable manner in order that no suitable habitat for amphibians is created;
 - e. During construction, any holes, trenches or other pits which amphibians could fall into must be covered overnight, or have sloped banks or ramps suitable for their escape;
 - f. The use of chemicals (such as fertilisers and herbicides) harmful to amphibians should be avoided wherever possible;
 - g. If it is suspected that a great crested newt has been found works in that area must cease and ERAP (Consultant Ecologists) Ltd. (01772 750 502) or Natural England (0300 060 6000) must be contacted immediately for further assistance;
 - h. No site contractors must handle a great crested newt; and



i. If any other amphibian species (such as smooth newt, common toad or common frog) is detected on site, it must be carefully picked up, placed in a clean bucket and moved to an area of suitable habitat beyond site boundary.

5.8 Landscape Planting

- 5.8.1 It is recommended that the landscape planting within the residential site is composed from native species and species known to be of value for the attraction of wildlife.
- 5.8.2 It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting. Suitable species are presented at **Table 5.1**, below.

Scientific Name	Common Name	Scientific Name	Common Name
Acer campestre	Field Maple	Prunus spinosa	Blackthorn
Corylus avellana	Hazel	Rosa arvensis	Field Rose
Crataegus monogyna	Hawthorn	Rosa canina	Dog-rose
llex aquifolium	Holly	Sambucus nigra	Elder
Malus sylvestris	Crab Apple	Sorbus aucuparia	Rowan
Prunus avium	Wild Cherry	Ulmus glabra	Wych Elm
Prunus padus	Bird Cherry	Viburnum opulus	Guelder Rose

Table 5.1: Suitable Native Species for Tree and Shrub Planting

- 5.8.3 The understorey and ground cover planting design should be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.
- 5.8.4 Planting schemes that include flowering species such as *Viburnum, Ceanothus, Hebe, Lavandula, Lonicera, Potentilla, Rosmarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.
- 5.8.5 For further plants suitable for the attraction of pollinators please refer to the *Perfect for Pollinators Plant List* (Royal Horticultural Society, 2012). It is recommended that the selection of plant species at the site ensures that a variety of flowering species are available throughout the year.
- 5.8.6 Suitable wildflower planting, including wetland species in areas associated with ponds, should be incorporated into the site layout.

6.0 CONCLUSION

- 6.1 This ecological appraisal has demonstrated that a residential development at the site is feasible and acceptable in accordance with ecological considerations and the National Planning Policy Framework.
- 6.2 It is possible to implement reasonable actions for the protection and long-term conservation of fauna such as roosting bats, nesting birds and commuting/foraging bats associated with the site.
- 6.3 Redevelopment at the site will provide an opportunity to secure ecological enhancement for fauna typically associated with residential areas such as breeding birds and roosting bats.



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8.0 APPENDIX 1: TABLES AND FIGURES

Table 8.1: Plant Species List for Farmyard and Northern Boundary

Scientific Name	Common Name	DAFOR ¹	Cover		
	Moss species	LA	<1%		
Acer campestre	Field Maple	LA	2%		
Acer platanoides	Norway Maple	LA	2%		
Acer pseudoplatanus	Sycamore	LF	<1%		
Agrostis capillaris	Common Bent	LA	1%		
Anthriscus sylvestris	Cow Parsley	VLA	<1%		
Betula pendula	Silver Birch	LA	2%		
Calystegia sepium	Hedge Bindweed	VLA	<1%		
Cerastium fontanum	Common Mouse-ear	LA	1%		
Chamerion angustifolium	Rosebay Willowherb	0	3%		
Cirsium arvense	Creeping Thistle	VLF	<1%		
Cirsium vulgare	Spear Thistle	VLF	<1%		
Crataegus monogyna	Hawthorn	LA	2%		
Dactvlis glomerata	Cock's-foot	F	10%		
Elvtrigia repens	Common Couch	LA	1%		
Epilobium hirsutum	Great Willowherb	0	2%		
Fallopia iaponica	Japanese Knotweed	LA	1%		
Festuca rubra	Red Fescue	LA	1%		
Fraxinus excelsior	Ash	LF	2%		
Galanthus nivalis	Snowdrop	R	<1%		
Galium aparine	Cleavers	0	5%		
Geranium robertianum	Herb-Robert	VLF	<1%		
Hedera helix	lvv	LA	2%		
Hieracium sp.	Hawkweed species	VLF	<1%		
Holcus lanatus	Yorkshire-fog	F	10%		
Hvacinthoides sp	Non-native Bluebell	VI F	<1%		
llex aquifolium	Holly	VLF	<1%		
Impatiens glandulifera	Indian Balsam	0	5%		
Iris pseudacorus	Yellow Iris	VLF	<1%		
Juncus effusus	Soft-rush	VLA	<1%		
Lamium album	White Dead-nettle	VLA	<1%		
Lolium perenne	Perennial Rve-grass	F	20%		
Narcissus pseudonarcissus	Daffodil	VLA	<1%		
Plantago lanceolata	Ribwort Plantain	VLF	<1%		
Plantago maior	Greater Plantain	VLF	<1%		
Poa annua	Annual Meadow-grass	LA	2%		
Poa pratensis	Smooth Meadow-grass	0	3%		
Poa trivialis	Rough Meadow-grass	0	2%		
Ranunculus repens	Creeping Buttercup	LF	<1%		
Rubus fruticosus agg.	Bramble	LA	5%		
Rumex acetosa	Common Sorrel	VLF	<1%		
Rumex obtusifolius	Broad-leaved Dock	LF	<1%		
Sagina procumbens	Procumbent Pearlwort	VLF	<1%		
Salix caprea	Goat Willow	LF	2%		
Salix cinerea	Grey Willow	LF	2%		
Senecio jacobaea	Common Ragwort	VLF	<1%		
Stellaria media	Common Chickweed	LA	2%		
Taraxacum officinale agg.	Dandelion	LF	<1%		
Typha latifolia	Bulrush	VLF	<1%		
Urtica dioica	Common Nettle	LA	10%		
¹ Key to DAFOR: D=Dominan	t, A=Abundant, F=Frequen	t, O=Occasion	al, R=Rare,		
V=Very, L=Local and *denotes a constant species					



Scientific Name	Common Name	DAFOR ¹	Cover
	Moss species	LA	5%
Achillea millefolium	Yarrow	VLF	<1%
Agrostis capillaris	Common Bent	LA	<1%
Alopecurus pratensis	Meadow Foxtail	LA	<1%
Bellis perennis	Daisy	LA	<1%
Cardamine pratensis	Cuckooflower	VLA	<1%
Cerastium fontanum	Common Mouse-ear	VLA	<1%
Chamerion angustifolium	Rosebay Willowherb	LA	2%
Cirsium arvense	Creeping Thistle	VLF	<1%
Cirsium vulgare	Spear Thistle	R	<1%
Crataegus monogyna	Hawthorn	LA	5%
Dactylis glomerata	Cock's-foot	А	10%
Elytrigia repens	Common Couch	LA	<1%
Equisetum arvense	Field Horsetail	VLF	<1%
Festuca rubra	Red Fescue	LA	<1%
Fraxinus excelsior	Ash	LA	5%
Galium aparine	Cleavers	LA	5%
Geranium robertianum	Herb-Robert	VLF	<1%
Heracleum mantegazzianum	Giant Hogweed	LA	5%
Holcus lanatus	Yorkshire-fog	Α	10%
Hyacinthoides sp.	Non-native Bluebell	VLA	<1%
llex aquifolium	Holly	VLA	5%
Impatiens glandulifera	Indian Balsam	0	5%
Juncus effusus	Soft-rush	VLA	<1%
Lolium perenne	Perennial Rye-grass	A*	30%
Myosotis arvensis	Field Forget-me-not	VLF	<1%
Plantago lanceolata	Ribwort Plantain	LF	<1%
Poa annua	Annual Meadow-grass	LA	<1%
Poa pratensis	Smooth Meadow-grass	F	5%
Poa trivialis	Rough Meadow-grass	F	5%
Primula veris	Cowslip	VLF	<1%
Ranunculus acris	Meadow Buttercup	VLF	<1%
Ranunculus repens	Creeping Buttercup	LA	<1%
Rubus fruticosus agg.	Bramble	VLA	<1%
Rumex acetosa	Common Sorrel	LF	<1%
Rumex obtusifolius	Broad-leaved Dock	LA	<1%
Sagina procumbens	Procumbent Pearlwort	VLA	<1%
Stellaria media	Common Chickweed	VLA	<1%
Taraxacum officinale agg.	Dandelion	VLA	<1%
Trifolium repens	White Clover	LA	<1%
Urtica dioica	Common Nettle	0	5%

Table 8.2: Plant Species List for the Field Unit



Table 8.3: Plant Species List for Hedgerows 1 to 3

		Hedge	row 1	Hedge	erow 2	Hedge	erow 3
			%		%		%
Scientific Name	Common Name	DAFOR	Cover	DAFOR	Cover	DAFOR	Cover
Woody species							
Acer pseudoplatanus	Sycamore	-	-	-	-	LA	5%
Crataegus monogyna	Hawthorn	A*	90%	A*	95%	A*	95%
llex aquifolium	Holly	LA	5%	LA	5%	-	-
Quercus robur	Pedunculate Oak	LA	5%	-	-	-	-
Herb layer							
Anthriscus sylvestris	Cow Parsley	0	15%	0	15%	-	-
Dactylis glomerata	Cock's-foot	LA	10%	LA	10%	-	-
Festuca rubra	Red Fescue	LF	<1%	LF	<1%	-	-
Galium aparine	Cleavers	A*	25%	A*	25%	A*	20%
Geranium robertianum	Herb-Robert	-	-	-	-	LA	10%
Hedera helix	lvy	LA	10%	LA	10%	LA	10%
Holcus lanatus	Yorkshire-fog	LA	10%	LA	10%	LA	10%
Hyacinthoides sp.	Non-native Bluebell	-	-	-	-	VLA	<1%
Lolium perenne	Perennial Rye-grass	LA	15%	LA	15%	LA	15%
Narcissus pseudonarcissus	Daffodil	VLA	<1%	-	-	VLA	<1%
Poa annua	Annual Meadow-grass	LF	<1%	LF	<1%	LA	<1%
Poa pratensis	Smooth Meadow-grass	LA	5%	LA	5%	-	
Poa trivialis	Rough Meadow-grass	LF	<1%	LF	<1%	LF	<1%
Ranunculus repens	Creeping Buttercup	-	-	-	-	LA	15%
Rubus fruticosus agg.	Bramble	VLA	<1%	VLA	<1%	-	-
Taraxacum officinale agg.	Dandelion	LA	<1%	VLA	<1%	-	-
Urtica dioica	Common Nettle	LA	10%	LA	10%	LA	10%
¹ Key to DAFOR: D=Dominar	nt, A=Abundant, F=Freque	nt, O=Occa	sional, R=	=Rare, V=V	ery, L=Loc	cal and *der	notes a
constant species.							

Species highlighted in grey are classed as either 'woody' or 'woodland' species contributing to *The Hedgerows Regulations 1997* Wildlife and Landscape criteria assessment.



Table 8.4: The Hedgerow Regulations 1997 Assessments Results of Hedgerows 1 to 3

Hedgerow Name	Hee	dgerow	1	H	Hedgerow 2		Н	Hedgerow 3	
Height x width (metres)		2 x 2			2 x 2			2 x 2.5	
Length (metres)	Ì	97		28		32			
Continuity	1	100%			100%			100%	
Management	1	Cut			Cut			Cut	
Total number of woody species	Ì	3			2			1	
Average Number of Qualifying Woody Specie	es:						•		
Section number	1	2	3	1	2	3	1	2	3
Qualifying woody species	1	-	-	1	-	-	2	-	-
Average number		1			1			2	
Number of Features Present:									
(a) Bank or wall along at least ½ length		No			No			No	
(b) Gaps which in agg. do not exceed 10%		Yes			Yes			Yes	
(c)-(e) 1 standard tree per 50m		No (1)			No			No	
(f) At least 3 woodland species within 1 metre		No			No			No	
(g) Ditch along at least ½ its length		No		No			No		
(h) Connections scoring 4 points or more		No		No		No			
(i) Parallel hedge within 15m	1	No		No		No			
Total Features	1		1		1				
Criteria for Hedgerow Importance 1: Hedgerow contains species listed as:									
(1) Part 1 of Schedule 1, Schedule 5 or Schedule 8 of W&C Act 1981	No		No			No			
(2) Declining breeders in 'Red Data Birds of Britain'	No			No			No		
(3) Categorised as 'endangered', 'extinct' or 'vulnerable'	No		No		No				
Criteria for Hedgerow Importance 2: Hedgerov	w Include	es all wo	oody sp	pecies r	nentione	d in (i)-(i	v):		
(i) At least 7 woody species		No		No		No			
(ii) At least 6 woody species and at least 3 features	No		No		No				
(iii) At least 6 woody species, inc. one of: Black Poplar, L-leaved Lime, S-leaved Lime or Wild Service Tree	No		No		No				
(iv) At least 5 woody species, and has 4 features	No			No		No			
Criteria for Hedgerow Importance 3: Is adjace woody species on average and 2 features from (nt to is a a) to (g):	djacent	to a br	idleway	, footpatl	n or bywa	ay <i>and</i> in	cludes at	least 4
Qualifies:		No			No			No	
Hedgerow Classed as Important?		No			No			No	



Table 8.5: Table of Photographs



Photo 1: Colonising vegetation at farmyard



Photo 3: Semi-improved grassland associated with farmyard



Photo 5: Scrub and boundary trees at northern area of site



Photo 2: Colonising vegetation at farmyard



Photo 4: Tall-herb vegetation at northern area of site



Photo 6: Semi-improved grassland at field unit













Photo 19: Northern elevation of Building 1



Photo 21: Southern elevation of Building 1



Photo 20: Western elevation of Building 1



Photo 22: Potential roost features at northern elevation at Building 1



Photo 23: Potential roost features at northern elevation such as gaps beneath the roof slates



Photo 24: Potential roost features at southern elevation (i.e. gaps between the roof slates)









Photo 36: Internal area of Section B2a











Photo 44: Southern and eastern elevations of Building 4



Photo 45: Internal area of Building 4



Photo 46: Southern elevation of Building 5



Photo 47: Eastern elevation of Building 5



Photo 48: Western elevation of Building 5







Table 8.6: Activity Survey 1, Date: 5th June 2018, Sunrise time: 04:45, Start time: 02:45

Survey Position 1: Marie Pickering

Time	Species	Notes		
03:21	Common pipistrelle	Brief pass, heard not seen		
03:31	Common pipistrelle	Brief pass, heard not seen		
03:34	Common pipistrelle	Foraging over Building 2		
03:39	Common pipistrelle	Foraging over Building 2		
03:47 Common pipistrelle Foraging south of Building 2				
The Anabat Express made the following recordings:				
27 common pipistrelle recordings between 02:55 and 03:47.				

27 common pipistrelle recordings between 02:55 and 03:47.

Survey Position 2: Aidan Pickering

Time	Species	Notes		
03:10	Common pipistrelle	Foraging south of Building 2		
03:19	Common pipistrelle	Foraging south of Building 2		
03:23	Common pipistrelle	Foraging south of Building 2		
03:38	Common pipistrelle	Foraging south of Building 2		
The Anabat Express made the following recordings:				
48 common pipistrelle recordings between 02:56 and 05:39; and				
1 soprano pipistrelle	recording at 03:15.			

Survey Position 3: Amy Sharples

Time	Species	Notes	
0.:21	Common pipistrelle	Flying east to west	
03:21	Common pipistrelle	Flying east to west	
03:29	Common pipistrelle	Flying east to west	
03:34	Common pipistrelle	Heard not seen (HNS)	
03:37	Common pipistrelle	Flying east to west	
03:41	Common pipistrelle	Brief pass, heard not seen	
03:42	Common pipistrelle	Foraging south of Building 2	
03:44	Common pipistrelle	Flying east to west	
03:45	Common pipistrelle	Flying east to west	
03:58	Common pipistrelle	Flying west to east	
The Anabat Express made the following recordings:			
15 common pipistrelle recordings between 03:10 and 04:00.			



Survey Position 4: Danielle Rowlands

Time	Species	Notes
03:17	Common pipistrelle	HNS
03:20	Common pipistrelle	HNS
03:22	Common pipistrelle	Flying east to west
03:25	Common pipistrelle	Flying south to north
03:29	Common pipistrelle	Flying east to west
03:37	Common pipistrelle	HNS
03:38	Common pipistrelle	Flying south to north
03:41	Common pipistrelle	Flying south to north
03:43	Common pipistrelle	HNS
03:44	Common pipistrelle	Flying north to south
03:46	Common pipistrelle	Flying north to south
03:47	Common pipistrelle	Flying north to south
03:49	Common pipistrelle	Flying north to south
03:50	Common pipistrelle	Flying west to east
03:52	Common pipistrelle	HNS
03:55	Common pipistrelle	HNS
03:58	Common pipistrelle	HNS
03:58	Common pipistrelle	Flying south to north
04:03	Common pipistrelle	HNS
04:06	Common pipistrelle	HNS
04:09	Common pipistrelle	HNS
No Anabat Express	used.	

Survey Position 5: Stuart Laverick

Time	Species	Notes		
03:15	Common pipistrelle	Flying west to east		
03:26	Common pipistrelle	HNS		
03:37	Common pipistrelle	Flying south to north		
03:46 to 03:55	Common pipistrelle	Flying west to east		
The Anabat Express made the following recordings:				
59 common pipistrelle recordings between 03:10 and 04:52; and				
2 soprano pipistrelle recordings at 03:40 and 03:56.				

Survey Position 6: Chris Wilkinson

Time	Species	Notes		
03:10	Common pipistrelle	HNS		
03:15	Common pipistrelle	HNS		
03:18	Common pipistrelle	HNS		
03:19	Common pipistrelle	HNS		
03:26	Common pipistrelle	HNS		
03:27	Common pipistrelle	HNS		
03:38	Common pipistrelle	HNS		
03:45	Common pipistrelle	HNS		
03:51	Common pipistrelle	HNS		
The Anabat Express made the following recordings:				
29 common pipistrelle recordings between 02:57 and 03:59; and				
2 soprano pipistrelle	2 soprano pipistrelle recordings at 03:40 and 03:57.			



Table 8.7: Activity Survey 2, Date: 28th June 201, Sunrise time: 04:43, Start time: 03:00

Survey Position 1: Marie Pickering

Time	Species	Notes
02:56	Common pipistrelle	Foraging south of Building 2
03:30	Common pipistrelle	Foraging south of Building 2
03:50	Common pipistrelle	Foraging south of Building 2
No Anabat Express used		

Survey Position 2: Aidan Pickering

Time	Species	Notes			
02:55	Common pipistrelle	Foraging south of Building 2			
03:07	Common pipistrelle	Foraging south of Building 2			
03:09	Common pipistrelle	Foraging south of Building 2			
03:13	Common pipistrelle	Foraging south of Building 2			
03:15	Common pipistrelle	Foraging south of Building 2			
03:18	Common pipistrelle	Foraging south of Building 2			
03:22	Common pipistrelle	Foraging south of Building 2			
03:30	Common pipistrelle	Foraging south of Building 2			
03:37	Common pipistrelle	Foraging south of Building 2			
03:40	Common pipistrelle	Foraging south of Building 2			
03:57	Common pipistrelle	Foraging south of Building 2			
The Anabat Express did not make any recordings.					



Survey Position 3: Amy Sharples

Time	Species	Notes
03:05 to 03:17	Common pipistrelle	Flying south to east
03:19	Common pipistrelle	Flying south to west
03:21	Common pipistrelle	Flying south to west
03:22	Common pipistrelle	Foraging to east of Building 1
03:26	Common pipistrelle	Flying south to west
03:28	Common pipistrelle	Flying south to east
03:29	Common pipistrelle	Flying east to south
03:29	Common pipistrelle	Flying south to east
03:30	Common pipistrelle	Flying south to west
03:30	Common pipistrelle	Flying east to south
03:30	Common pipistrelle	Flying south to west
03:30	Common pipistrelle	Flying south to east
03:32	Common pipistrelle	Flying east to south
03:33	Common pipistrelle	Flying south to east
03:34	Common pipistrelle	Flying south to west
03:34	Common pipistrelle	Flying east to south
03:35	Common pipistrelle	Flying south to east
03:35	Common pipistrelle	Flying south to west
03:40	Common pipistrelle	Flying south to east
03:41	Common pipistrelle	Flying east to south
03:41	Common pipistrelle	Flying west to east
03:41	Common pipistrelle	Flying east to south
03:42	Common pipistrelle	Flying south to west
03:43	Common pipistrelle	Flying south to west
03:43	Common pipistrelle	Flying west to east
03:46	Common pipistrelle	Flying south to east
03:46	Common pipistrelle	Flying south to west
03:46	Common pipistrelle	Flying west to east
03:46	Common pipistrelle	Flying east to south
03:46	Common pipistrelle	Flying south to west
03:46	Common pipistrelle	Flying east to south
03:46	Common pipistrelle	Flying east to south
03:48	Common pipistrelle	Flying south to east
03:48	Common pipistrelle	Flying east to south
03:48	Common pipistrelle	Flying west to east
03:50	Common pipistrelle	Flying south to east
03:50	Common pipistrelle	Flying south to west
03:50	Common pipistrelle	Flying east to south
03:53	Common pipistrelle	Foraging to east of Building 1
03:54	Common pipistrelle	Flying south to east
The Anabat Express	s made the following reco	rdings:
64 common pipistre	lle recordings between 03	3:06 and 03:54; and
1 soprano pipistrelle	e recording at 03:46.	



Survey Position 4: Danielle Rowlands

Time	Species	Notes					
03:00	Common pipistrelle	Foraging to west of Building 1					
03:05	Common pipistrelle	Foraging to west of Building 1					
03:14	Common pipistrelle	HNS					
03:15	Common pipistrelle	Foraging to west of Building 1					
03:25	Common pipistrelle	Flying west to east					
03:33	Common pipistrelle	Foraging to west of Building 1					
03:36	Common pipistrelle	Foraging to west of Building 1					
03:40	Common pipistrelle	Foraging to west of Building 1					
05:57	Common pipistrelle	Foraging to west of Building 1					
The Anabat Express made the following recordings:							
151 common pipistrelle recordings between 03:00 and 03:57.							

Survey Position 5: Natasha Reese

Time	Species	Notes				
03:00 to 03:57 Common pipistrelle Constant foraging to south of Building 1						
The Anabat Express made the following recordings:						
61 common pipistrelle recordings between 03:25 and 03:57.						

Survey Position 6: John Harrison Bryant

Time	Species	Notes				
03:16	Common pipistrelle	Foraging to south of Building 1				
03:17	Common pipistrelle	Foraging to south of Building 1				
03:19	Common pipistrelle	Foraging to south of Building 1				
03:29 to 03:47	Common pipistrelle	Constant foraging to south of Building 1				
03:55	Common pipistrelle	Flying east to west				
03:58	Common pipistrelle Foraging to south of Building 1					
The Anabat Walkabout made the following recordings:						
126 common pipistr	elle recordings between (03:08 and 03:54.				





Figure 1: Google Earth Image to Illustrate the Site Boundary and Ponds



Figure 2: Phase 1 Habitat and Vegetation Map











Figure 4: Bat Activity Survey Results

Figure 5: Constraints and Opportunities Plan







9.0 APPENDIX 2: ENVIRONMENTAL DNA RESULTS



 Folio No:
 E2844

 Report No:
 1

 Order No:
 2018-109b Pond 2

 Client:
 ERAP LTD

 Contact:
 Amy Sharples

 Contact Details:
 amy.sharples@erap.co.uk

 Date:
 16/05/2018

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS

Date sample received at Laboratory:	11/05/2018
Date Reported:	16/05/2018
Matters Affecting Results:	None

RESULTS Lab Sample No.	Site Name	O/S Reference	SIC		DC		IC		Result	I Re	Positive Policates
2026	Garrett Hall Farm, Pond 2	SD 70740162	Pass	ĩ	Pass	Ŷ	Pass	ľ	Negative	Ĩ	0
2092	Garrett Hall Farm, Pond 1	SD 70740162	Pass	32	Pass	8	Pass	ľ	Negative	Ĩ.	0

SUMMARY

When Great Crested Newts (GCN); Triturus cristatus inhabit a pond, they deposit traces of their DNA in the water as evidence of their presence. By sampling the water, we can analyse these small environmental DNA (eDNA) traces to confirm GCN habitation, or establish GCN absence.

The water samples detailed below were submitted for eDNA analysis to the protocol stated in DEFRA WC1067 (Latest Amendments). Details on the sample submission form were used as the unique sample identity.

Forensic Scientists and Consultant Engineers SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com Company Registration No. 08950940

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RESULTS INTERPRETATION

Lab Sample No.- When a kit is made it is given a unique sample number. When the pond samples have been taken and the kit has been received back in to the laboratory, this sample number is tracked throughout the laboratory.

Site Name- Information on the pond.

O/S Reference - Location/co-ordinates of pond.

SIC- Sample Integrity Check. Refers to quality of packaging, absence of tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to results errors. Inspection upon receipt of sample at the laboratory. To check if the Sample is of adequate integrity when received. Pass or Fail.

DC- Degradation Check. Analysis of the spiked DNA marker to see if there has been degradation of the kit since made in the laboratory to sampling to analysis. Pass or Fail.

IC-Inhibition Check- PCR inhibitors can cause false results. Inhibitors are analysed to check the quality of the result. Every effort is made to clean the sample pre-analysis however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.

Result- NEGATIVE means that GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as no evidence of GCN presence. POSITIVE means that GCN eDNA was found at or above the threshold level and the presence of GCN at this location at the time of sampling or in the recent past is confirmed. Positive or Negative.

Positive Replicates- To generate the results all of the tubes from each pond are combined to produce one eDNA extract. Then twelve separate analyses are undertaken. If one or more of these analyses are positive the pond is declared positive for the presence of GCN. It may be assumed that small fractions of positive analyses suggest low level presence but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive.

METHODOLOGY

The laboratory testing adheres to strict guidelines laid down in WC1067 Analytical and Methodological Development for Improved Surveillance of The Great Crested Newt, Version 1.1

The analysis is conducted in two phases. The sample first goes through an extraction process where all six tubes are pooled together to acquire as much eDNA as possible. The pooled sample is then tested via real time PCR (also called q-PCR). This process amplifies select part of DNA allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines PCR amplification and detection into a single step. This eliminates the need to detect products using gel electrophoresis. With qPCR, fluorescent dyes specific to the target sequence are used to label PCR products during thermal cycling. The accumulation of fluorescent signals during the exponential phase of the reaction is measured for fast and objective data analysis. The point at which amplification begins (the Ct value) is an indicator of the quality of the sample. True positive controls, negatives and blanks as well as spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared so they act as additional quality control measures.

The primers used in this process are specific to a part of mitochondrial DNA only found in GCN ensuring no DNA from other species present in the water is amplified. The unique sequence appropriate for GCN analysis is guoted in DEFRA WC 1067 and means there should be no detection of closely related species. We have tested our system exhaustively to ensure this is the case in our laboratory. We can offer eDNA analysis for most other species including other newts.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. Kits are manufactured by SureScreen

Forensic Scientists and Consultant Engineers SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com Company Registration No. 08950940

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Scientifics to strict quality procedures in a separate building and with separate staff, adopting best practice from WC1067 and WC1067 Appendix 5. Kits contain a 'spiked' DNA marker used as a quality control tracer (SureScreen patent pending) to ensure any DNA contained in the sampled water has not deteriorated in transit. Stages of the DNA analysis are also conducted in different buildings at our premises for added

SureScreen Scientifics Ltd also participate in Natural England's proficiency testing scheme and we also carry out inter-laboratory checks on accuracy of results as part of our quality procedures.

Reported by: Derry Hickman

Approved by: Troy Whyte

End Of Report

Forensic Scientists and Consultant Engineers SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com Company Registration No. 08950940

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